LIBRARY
RECEIVED
JUL 16 1928
U.S. Department of Agriculture

Food Manufacture

THE JOURNAL OF THE FOOD INDUSTRY

A Journal devoted to the production and manufacture of:

Chocolate, Confectionery, Biscuits, Bread, Cake, Beers, Cordials, Milk, and Invalid Foods, Tonic and Alcoholic Wines, Ice Cream, Patent Flours, Sugar, Preserved Fruits and Meats and Fish, Pastes and Extracts; Essences, Flavourings, Sauces and all edible commodities involving a process of manufacture.

Annual Subscription, 10/- (including postage). Single copies, 1/-

JULY, 1928 **Vol. III., No. 3**

Publishing, Editorial and Advertisement Offices:
THANET HOUSE, 231-2, STRAND, LONDON, W.C. 2
(Opposite the Law Courts).
Proprietors and Publishers: LEONARD HILL, LTD.

FOOD MANUFACTURING EQUIPMENT

Complete Installations

for Condensed and Dried Milk, Patent Foods, Starches, Chocolate, Malt Preparations, Egg Products, Coffee Extract, Essences, Flavourings, Colours and similar products, *also*

PASSBURG'S
Vacuum Evaporators
Vacuum Dryers
Tablet Compressing Machines
Powder Filling and Packing Machines

Mixing, Kneading, Distilling and Extracting Apparatus of every Type

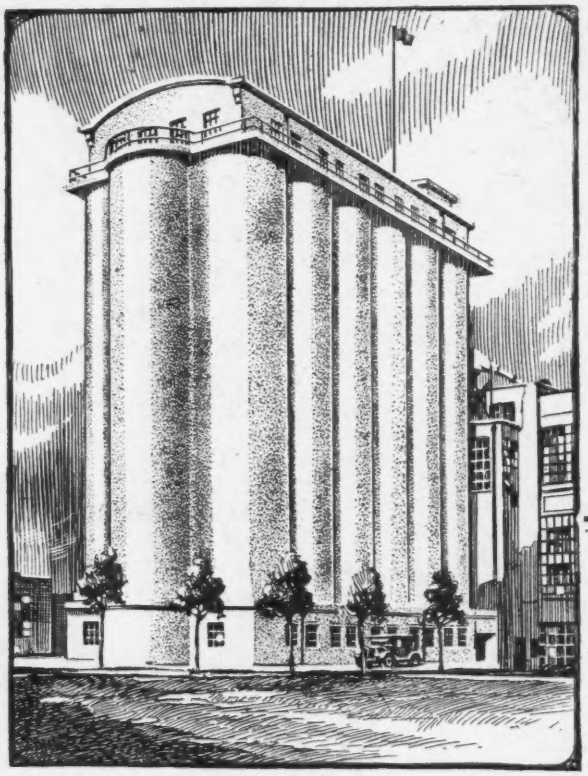
ICE & REFRIGERATING PLANTS

HUGH GRIFFITHS

15 NEW BRIDGE STREET, LONDON, E.C. 4

Telephone: City 3302
Telegrams: Dehydrate, Lud, London

Build to last in Reinforced Concrete and eliminate cost of maintenance



Grain Silos at Welwyn for The Shredded Wheat Company.
Clients: Thomas Robinson & Son, Ltd., Rochdale.

REINFORCED CONCRETE is the ideal material to use for your new buildings; it is Rot proof; Vermin proof and Sanitary; looks after itself and therefore requires no upkeep.

Designs and Estimates for complete erection of any type of building to suit your requirements submitted free of obligation.

All our buildings are erected under Guarantee from foundations to completed structure.

For

FACTORIES, WAREHOUSES
STORAGE BUNKERS, TANKS
BINS, SILOS, PILING, ETC.

Illustrated Brochure sent free on request.

Enquiries to "F" Dept.

PETER LIND & Co. LTD. *Engineers and Contractors*

2 CENTRAL BUILDINGS, WESTMINSTER, S.W. 1

and at 5 NEW BROWN STREET, MANCHESTER

Telegrams: "INNELOCLIN, PHONE, LONDON." Telephone (3 lines): 3746–7 / 7121 } VICTORIA.

Food Manufacture

THE JOURNAL OF THE FOOD INDUSTRY

Published every month at
THANET HOUSE, 231-2, STRAND, LONDON, W.C. 2
(Opposite the Law Courts)

Annual Prepaid Subscription, 10s. post free

Telephone: Central 8217. *Proprietors: Leonard Hill, Ltd.*

Vol. III., No. 3 | The editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings whenever possible. | July, 1928

CONTENTS

	PAGE		PAGE
EDITORIAL COMMENTS	385	CANNING RESEARCH	399
PROGRESS—A LOOK INTO THE FUTURE OF THE CONFECTIONERY INDUSTRY	389	THE COST OF COOKING PRESERVES BY THE VACUUM PAN	401
FORTHCOMING EXHIBITIONS	392	TRADE NEWS	402
THE SALMON CANNING INDUSTRY—PART III.	393	OVERSEAS NEWS	403
FACTORS INFLUENCING THE BAKING PROPERTIES OF FLOUR—PART III.	397	COMMERCIAL AND LEGAL NEWS	407
		CURRENT LITERATURE	409
		RECENT PATENTS	410

Labels for Jam.

SEVERAL TIMES lately we have felt those gentle puffs that herald an approaching breeze. This time they blow from Lancashire. In his annual report, the Medical Officer of Health for that county admits that a large quantity of the jam sold throughout the county is of excellent quality and that it is being prepared under hygienic conditions from first-grade materials. Such jams do not blush behind their labels, "Prepared from fresh fruit and sugar only"; they are admirable in every way, and their conscience is clear.

Unfortunately for them, and for practically everyone else, a very much larger quantity (so the report states) is prepared from inferior products; there is no comparison between the two articles—except that both are harmless, which is somewhat faint praise. Of course, superior jam is more than harmless; it is a food of the very first order. But how is the housewife to distinguish the good from the bad, the definitely nourishing from the merely harmless? Obviously, only by means of the requisite information conveyed by a notice affixed to the article. Selling a jam, whose sole merit is its harmlessness, in the guise of the article which we expect to get in exchange for hard-earned money, is an offence against society of no less magnitude than passing off a mule as a horse upon an inexperienced and unsuspecting purchaser; besides, if this latter practice were at all prevalent, it would not benefit the horse trade, neither would the mule traders profit in the long run.

We are all for full and explicit labelling, giving completely the relevant particulars about the ingredients used, even to the extent of their approximate proportions. It is our opinion that the advertising value of frank disclosure has not been fully appreciated by many manufacturers.

U.S. Standards for Preserves.

In the above connection, it is interesting to note that Bills (S. 3894 and H.R. 12693) have been introduced by Senator Jones and Representative Reed to define fruit, jams, preserves, jellies, apple butter, and maraschino cherries, to provide standards for them, to require labelling to prohibit adulteration or misbranding and to regulate interstate traffic in these products.

The proposed legislation defines preserves, jams, and jellies on the basis of the fruit, sugar, and pectin used, and in Section 6 of the Bill requires appropriate labelling such as "Fruit preserve," "Fruit and Pectin Preserve," "Pectin and Fruit Preserve," "Fruit and sugar," and "Imitation preserve." In the definition for apple butter it is provided that it shall contain not less than 35 per cent. of water soluble solids and be prepared from not more than twenty pounds of sugar to each fifty pounds of fruit.

The Bill requires that when corn syrup is used in place of sugar in the manufacture of the articles

defined, except those which are labelled "imitation," the words "corn syrup" shall precede the name of the product upon the label and shall appear in equal size type and have equal prominence.

It is also provided that all fruit products which resemble preserves, jam or jelly, as defined in the Bill, except citrus-fruit marmalades, fruit pie fillings, and fountain crushed fruit labelled and sold as such, shall be deemed to be misbranded if not labelled as required in Section 6.

Following their introduction, these Bills were referred to the Senate Committee on Agriculture and Forestry and to the House Committee on Agriculture, respectively.

Mayonnaise.

Some months ago we referred to the inauguration of a movement in U.S.A. to institute standards and definitions for mayonnaise. On April 17 the first public hearing was called at Washington. After the proposed standard (which we quoted in a previous issue) had been read, the chairman called upon representatives of those manufacturers and others who had previously corresponded with the committee upon the matter. Every phase of the question was discussed, including whether or not those manufacturers who made the so-called salad dressing type of dressing would be permitted to call their product mayonnaise, or merely salad dressing; whether or not the consistency of a product would determine the class of salad dressing into which such particular types of salad dressing would fall; whether it was necessary or not to limit by either minimum or maximum quantities the content of each or all of the ingredients going into the manufacture of mayonnaise; whether or not a mayonnaise should contain a stabiliser, and what would differentiate a stabiliser from a filler, and many other questions too numerous to state here.

The Bashful Stranger.

What holds back that mysterious "preservative without SO_2" from stepping out into the open and revealing its identity? Is it an overpowering modesty, or has it been merely "boomeranged" into the oblivion by an empty boast? Since the appearance of our correspondent's inquiry in the May issue, we have been bombarded by readers eager to have some definite particulars in confirmation or otherwise of the rumour.

The inquiry that has raised such general interest ran as follows: "With reference to preservatives in food, we understand there is a fresh one that has lately come out, which contains no SO_2, and conforms in every way with the Government requirements, and it has a wonderful effect in preserving all food without detriment to the food or to the consumers. Can you give us any particulars of this material and the firm supplying it, as we understand it is now being taken up largely here and abroad, as it has got over the experimental stage?"

Is there any connection between this firm and the one to which the following note refers and which we extract from another letter: "The travellers for one particular South of England creamery company are boasting to customers that their company have solved the problem," or are there two distinct mysteries to be solved?

Fruit Drying.

It is announced that the Dominion experimental farms at Summerland and Agassiz, British Columbia, will this year undertake tests relative to the drying of fruit. The former station will concern itself with apricots and peaches, and the latter with berries and small fruits.

Crushed Peaches.

Last year's over-production in the Californian peach industry has prompted those two investigators, W. V. Cruess and J. H. Irish, to seek for a likely outlet for surplus product. Of several preparations developed experimentally, two stand out as having real commercial possibilities—namely, spiced or pickled peaches and crushed peaches. The former are now canned by several firms, and a good market seems to be opening up.

Cruess and Irish are convinced that crushed peaches are going to be a winner, and they have used the product in pies, ice-cream, candies, puddings, sauces, for making jams and butters, for preparing cake fillings and frostings, and for gelatine deserts.

New Preserving Method.

We should like to take this opportunity of bringing to the notice of Professor Cruess and Mr. Irish, who are readers of FOOD MANUFACTURE, another possible method of utilising surplus fruits. We do not know if they have included in their extensive survey of ways and means any variation of a preserving process which is said to have been recently developed in Germany. Probably they have; anyhow, we should like to know.

It is reported that, after many years of research, a German engineer, Karl Hessel, who has devoted his life to the problems of fruit and vegetable chemistry, has developed a method of preserving fresh fruit for indefinite time at a very low cost. The fresh fruit is reduced to a dry powder, which is pressed into small briquets. When these are dissolved in water, the substance and taste of the fresh fruit is revived. It is claimed that dried powder preserved in this way can be used in winter at a saving of about 80 per cent. of the price of fresh fruit out of season in Germany. Vegetables can also be preserved in this

fashion. If the rind or peel is included, the essential oils and aroma are retained, and since the product is cooked at a temperature of approximately 170° F., the vitamines are little affected.

For retail trade, the briquets are packed in pasteboard cartons, and are easily shipped, preserved, and stored. They can be chocolate or sugar coated and put into cube form, or they can be made into cakes or small sticks. In the kitchen, the powder can be used as sauce, *compote*, or ice-cream filling. We hear that the German Ministry of Agriculture and other Government officials have examined and approved of the new process.

Synthethic Cream.

In a written answer to Sir C. Morrison-Bell, Mr. Chamberlain said, on May 16, his attention had not been drawn to any specific cases in which it was alleged that reconstituted or synthetic cream was being sold as ordinary cream in public restaurants. He was not aware of any instance in which difficulty had been caused by the absence of a definition of "cream" in the Sale of Food and Drugs Act.

Cream and Preservatives.

Our remarks in the June issue on the preserving of cream appear to have aroused a lively interest in Scotland—judging by the letters we have received. It is a pity that our correspondents ask us to refrain from publishing these letters, because they are very interesting. Our remarks, it will be remembered, hinted at the efforts that are being made to find a commercial solution to the problem of preserving cream without the addition of preservative substances —that is to say, by a purely physical treatment. There is not the slightest doubt that this will be accomplished—just how, we cannot, of course, predict, but we cited a case by way of illustration which holds out the promise of at least potentialities. We have not seen this particular plant, and were therefore, not in a position to set down anything of a definite nature; nevertheless, we felt that some consideration was due to those who have made efforts towards achieving a laudable and much desired object, and thus we quoted the claims that have been made for the plant. This done, it now rests with the owners to substantiate these claims by practical demonstration, and with intending purchasers to satisfy themselves by proving the pudding before they eat it.

Cream and Glycerin.

Glycerin has recently been suggested as a cream preservative. What would be the attitude of Public Analysts toward such cases? A. F. Lerrigo discusses this point in the current issue of *The Analyst*. He points out that the presence of glycerin in an article of food does not constitute an offence. On the other hand, if glycerin increased the viscosity of cream, it would then come within the definition of a thickening agent. Mr. Lerrigo is of the opinion that, in any case, the addition of glycerin without notice would be regarded as being to the prejudice of the purchaser.

The presence of this substance can be readily detected. As regards its preservative action, experiments appear to show that it has none. The amount of glycerin which it has been proposed to incorporate in cream for preserving purposes is rather less than 1 per cent.; but samples of cream containing 1, 2, 3, 4, and 5 per cent. of glycerin increased in acidity at exactly the same rate as the original cream.

Calcium Biphosphate.

Relative to the correspondence on the subject of calcium biphosphate, following an article which was quite wrongly interpreted in some quarters, since the article in question, unsolicited as it was, did nothing more than record the honest opinions of a flour-milling chemist, we note that the Tribunal appointed under Section 10 (4) of the Finance Act, 1926, to hear the complaint that this article (baking powder quality) has been improperly excluded from the lists of articles chargeable with duty under Part I. of the Safeguarding of Industries Act, 1921, has awarded in favour of the complainants.

Calcium biphosphate (baking powder quality) will accordingly be added to the list, and will be chargeable with duty on importation, as from June 4.

"Ambulance Chasing."

The New York Bar Association has been investigating the "ambulance chasing" methods of certain lawyers, and has revealed the startling fact that a large number of licensed physicians of good repute have assisted in perpetrating frauds by testifying to non-existent injuries. It is declared that some doctors have sold X-ray photographs showing an injury on any part of the body for £1 to £3, and have issued false certificates to support suits for damages against restaurants, chemists, and food product manufacturers. In many instances, it is said, the doctors testifying to injuries or illness saw the claimant for the first time in court.

Fish Canning Research.

The Commercial Secretary to H.M. Legation at Oslo reports that, in connection with the contemplated erection of a laboratory for the fish-canning industry with the aid of a Government grant, a proposal has been advanced for an increase of the Norwegian export duty on canned herring and brisling from 10 to 15 öre per 100 boxes, the pro-

ceeds of the extra duty to be used for the working expenses of the laboratory. The proposals have not yet been introduced in the Storting.

Chemistry of Bread.

Dr. Kent-Jones read a paper on the chemistry of bread on January 13 at a meeting of the Birmingham Section of the Society of Chemical Industry, in the course of which he dealt in an interesting fashion with the chemistry of flour, varieties of wheat, wheat blending, milling, flour treatment, and breadmaking, tracing the manufacture of bread through all stages. He emphasised the increasingly important part which the chemist is playing in this industry, and with the growing appreciation of this, the milling and baking firms are availing themselves more and more of the services of the chemist. There is still an almost unlimited field for investigations and improvements.

This situation has largely resulted from the realisation of the colloidal nature of dough. The chemist visualises the protein particles scattered through that complex colloidal mass, dough, swelling and so knitting up with one another to form a spongy network holding granules of starch. Apparently, they do this in virtue of their strong powers due to the great surface they have per unit mass.

The power and elasticity of the dough, or what may be called, in short, the "strength," depends, when judged from this viewpoint, firstly, on the actual number of protein particles per unit of dough, and secondly, on the power of the protein particles to swell by hydration. Thus, if the number of protein particles was very small and the swelling power was poor, it is conceivable that they would not be able to join on to one another, and therefore there would not be a dough but merely a plastic mass. With English flours, for instance, the protein content is poor, as also is the swelling power. Hence the weakness of the dough. With Manitoba there is a large number of protein particles, and these also have a greater swelling and hydration capacity—hence the fine, elastic dough. Good swelling power can, therefore, neutralise to a marked extent lack of the actual amount of protein.

Improvers.

In reply to questions, Dr. Kent-Jones stated that succinic acid was one of the finest chemical improvers known; it did not bleach, but greatly improved the baking quality. As succinic acid was a by-product of fermentation, this was a matter of interest as indicating a possible *modus operandi* of improvers.

Also, as to the effect of proteolytic enzymes on strength, there was very little information available from the point of view of the baking trade, and there was an obvious field for work.

Again, the impression was general that the better aerated the loaf the better was its digestibility. The superiority of the Hungarian flour, years ago, was due to the fact that it was better milled than its competitors.

Boiled Sweets.

County Analyst G. D. Elsdon's views on boiled sweets and lemonade are worth recording. This expert considers that the Preservative Regulations allow too wide a latitude with regard to SO_2 in boiled sweets, since it is not required in this case as a preservative, but is used as a bleaching agent to cover the use of inferior grades of sugar.

Also, he points out that it is not desirable to use tartaric acid in the preparation of lemonade powder on the score that lemons do not contain it.

Pectin.

A meeting was held in the Department of Brewing and the Biochemistry of Fermentation, University of Birmingham, on May 12, when, amongst others, a paper was read by A. G. Norman on "The nature of the pectic substances in *situ*." The conclusion of Norris and Schryver that pectin exists in the plant uniformly as a trimethylated derivative of pectic acid, with the remaining carboxyl group free to react with a metallic ion, is challenged. This conclusion is based on the assumption that the pectin preparations obtained are pure, whereas such is not the case. The methoxyl content approximates more nearly to the tri-esterified form. Protopectin, the insoluble modification, has been stated by many to be pectin in combination with cellulose. A theory, more in keeping with facts, is that protopectin is a polymer consisting of several molecules of tetramethyl pectic acid associated with one or two partially de-esterified molecules, the free carboxyl groups of which are linked to metallic ions, such as iron or calcium.

The Index.

The Index to Volume II. will be found in the present issue. The third volume will be completed in December, and will include eight numbers; thenceforth, volumes will be annual.

Readers will notice that we have numbered the references to "Current Literature." This is introduced for the purpose of indexing, and provides an additional service to readers in that they will have in the classified Index at the end of the year a ready means of ascertaining all that has been published relating to any branch of food manufacture in which they happen to be interested. The value of this service, alone, is inestimable to every progressive mind in this wide and important field of industry.

Progress—A Look into the Future of the Confectionery Industry

J. VALENTINE BACKES, A.R.C.Sc., A.I.C., D.I.C.

What of thirty years hence in the Confectionery Industry? In what direction does progress lie? The author of this article, after recalling and assessing the advances made in the past thirty years, probes the future, points out the paths along which progress will be made, and holds out the promise of great things for the Industry.

IN A daily newspaper, recently, a certain amount of space was given to the prognostication of eminent scientists under the title: "What of Thirty Years Hence?" The articles were distinctive and of very general interest, for the glowing account of what science has in store for us was sufficient to inflame the optimist and raise at least a gleam of hope in the dismal life of the pessimist.

We are told that within thirty years we shall see the final conquest of disease. The work on vitamins and the assimilation of food will enable us to produce a race of men superior in every way to that struggling specimen of the animal kingdom which we now call "man."

Technical science will enter with full force into the field of production, and show us how to *develop* our raw materials as well as utilise them.

With the help of applied physiology and psychology, the question of stress and strain on the human system will be so obviated that each man will be in his right place, doing the maximum amount of work, with the loss of the least amount of physical energy and exertion.

In a word, the world of the future in the eyes of the optimistic scientist will be the home of contented man, who is sufficiently master of nature's resources to acquire perfection, produce unlimited output, and develop ever-increasing markets. Be this as it may, one point is obvious, and that is, that science is trying to do its share for mankind in general, to the development of that "Utopia" we long to see, but do so little to produce.

The Confectionery Business: Its Past

Apply all this to the confectionery industry and see where thirty years will carry us. What of thirty years hence in the Confectionery Industry?

It is easy to recall reminiscences and to enumerate the advances made in the past thirty years. Is this advance anything of which to be really proud? We look at the space occupied by the factory in 1898, and the space it occupies to-day, and judge advancement from this comparison. But does this tell the true story?

Set against this the progress in all industries throughout the world, the development of new centres, the increased earning power of an ever-increasing population, and it is at once realised that what was once a luxury is now a staple, everyday commodity within the reach of all, and the expansion of the chocolate and confectionery factory is due as much, if not more, to natural increase in demand, rather than actual advancement and progress in manufacture in the confectionery world.

It cannot be denied that advances have been made, but they still leave much to be desired. The confectionery trade was so conservative that it stood in danger of being choked by its own stagnation and being replaced. We all know the truth of this in the slump which came after the "boom" year following the war.

From 1914-1918 the public were deprived of the luxury of chocolate. As soon as the war closed, and they were once more able to indulge to the full, they took the opportunity, and the comparative output of the confectionery trade at that period was at its highest. But the slump came as rapidly as the "boom." The manufacturing confectioners could not hold the increased trade. Why? The public expected, not the product they knew before the war, but an article improved in every way—improved equivalent to the time which had elapsed for the better production of chocolate. But they did not get it, and the craving for chocolate was replaced by "My Lady Nicotine" and the "Eat more Fruit" campaigns.

Loss of Trade

Loss of trade in the confectionery industry is looked upon as due to unemployment, stagnated trade in the staple industries, poor circulation of money, and practically every other cause but the right one. Everyday life disposes of all these points. The luxuries indulged in by the millions, which a few years ago were the ideals of the few—the possession of motor-cars and the ownership of houses—even by the lower classes, prove the hollowness of this argument.

The loss of trade, or, shall we say, lack of *increased* trade, in the confectionery industry is due to the *industry* itself. The point that has got to be forgotten is that because a business was built on an article which sold thirty years ago, that same article will sell to-day. *It will only sell provided it carries with it thirty years' progressive improvement.* Improvement must be *constantly* added. Success in business does not only mean "keeping abreast with the times"—to be *ahead* of the times is the ultimate aim.

Recent Revival

It is encouraging to see this revival of progress in late years. The realisation of the previous argument has stimulated the industry to action. It can be safely

said that all the progress of the past thirty years has been accomplished in the last seven. It is a welcome sign, and with this latter progress, what will the next thirty years produce? In what direction does progress lie?

Future Progress

The first thing which is and will demand attention is "Efficiency." It is a word which has found its way into every factory and taken everyone by storm. Properly applied, it can do unlimited good, for after all, "efficiency" is only another way of expressing "perfect management" in its widest sense, and *not* as some people think, an over-abundance of machinery allocated to mass production, utilising the minimum of labour. Efficiency in production applies to *quality* as well as *quantity*, and while the manufacturer is inclined at present to apply it more to the latter, it is from the former his real success is to be gained in the future.

The very latest machinery is sufficiently productive. Improvement must come in the direction of improved quality of the output. The present enrober must be replaced by "the mechanical hand coverer," accurately controlled and adjusted, eliminating all possible troubles of "bloom," and producing a gloss and finish such as no hand coverer has contemplated. The "personal factor" on the enrober must be assisted by temperature control instruments, which will overcome those present troubles of heat of crystallisation of cocoa-butter and do away with that fluctuation due to seeding out and remelting the "stearins" in the chocolate. The "centres" and fondants must travel straight from the "Mogul" depositor to the enrober, and be covered within a few minutes of being cast, to produce a chocolate equal in mellowness to any three weeks old.

And so on, throughout the factory—the engineer will strive to make the pace towards efficiency. But the confectioner must always lead the way, and not let the engineer oust him from his own domain. The confectioner must only select that machinery which increases production in conjunction with improved quality, and must always sacrifice the former where a choice becomes eminent. The *primary* objective of improved machinery is not to *replace* man but to *assist* him in the better production of his goods.

Continental Practice

A tour of the larger continental factories shows how "Progress" and "Efficiency" are becoming more and more the slaves to mass production. On the continent the manufacturer concentrates his researches on "how to turn the stuff out" rather than "how to improve a moderately good article." Thus you see elaborate systems for mass production, and the saving of labour. Their utilisation of machinery is far in advance of England. The layout of their factories leaves us far behind in this direction. Yet while they can teach England much in mass production work, it is only at the expense of technique and finesse that it is done.

This brings up the point whether there can be such a thing as too much machinery in a confectionery factory. You will notice that generally speaking the workmen abroad are less enthusiastic than in England, and require more supervision. This may be due to the fact that their respective jobs are too mechanical owing to the mass of machinery in the factory, and so opportunities for personal initiative are reduced, with the resultant lack of interest. The chocolate and confectionery industry is one where the personal factor counts to a large extent, and once it is replaced by a mechanical substitute, the quality of the goods becomes dependent entirely on the machine, and lacks that "finish" which personal interest can give.

Hence, progress in the next thirty years will see no revolutionising of the industry. The "over-mechanicalising" of factories, foreseen by many, should be considered with caution, for while improvements and a much larger utilisation of machinery must and will come, there is a limit which the confectioner of the future must face. He must not let the "bogey" of mass production blind his "vision" to improving an already good article, as is the trend in many cases to-day.

Raw Materials

Improvements in the future of the confectionery industry will be less revolutionary than in other industries. It will be in the smaller fields in which progress will show itself, but which will have a marked effect. The basic raw materials of the industry are more or less standard, but in spite of this limitation the field for improvement is very vast. For chocolate one must have cocoa-beans, cocoa-butter, and sugar—its very definition demands this. Granted, there are unlimited variations, but we are dealing with basic ingredients in the light of progressive improvement. Yet, even considering these three raw materials, there is scope for improvement. The better cultivation of cocoa-beans, the development of finer aroma in the cheaper grades, the elimination of that great bugbear the cocoa moth, are all points which will add to progress of the future. The production of a cocoa-butter which will be so perfectly balanced in the oleic and stearic constituents as to avoid "bloom," yet still have a melting point below body heat, to render it edible, is an achievement we would welcome in the future.

Hydrogen Ion Concentration

The application of the hydrogen ion concentration theory to sugar confectionery is another case likely to do unlimited good. Its application in this direction is as yet in its infancy, but when freely applied it will have epoch-making results, and overcome many of the unsolved difficulties experienced in handling sugar. To explain the theory of hydrogen ion concentration is outside the scope of this article, but to show the importance of its bearing on the confectionery industry, a few specific examples will suffice. The hydrogen ion concentration, whether it be of sugar, glocose, gelatine, water, or the like, is its degree of acidity or alkalinity. The absolute neutral point is PH 7—thus, the numerals 1 to 7 represent acidity, and 7 to 14 alkalinity. It should be noted that the degree of acidity *decreases* as the numerical PH index increases, while the alkalinity

increases as the numerical index increases. Thus, PH 2 represents a higher degree of acidity than, say, PH 5, while PH 8 represents a lower degree of alkalinity than, say, PH 12. So much for a brief explanation.

Now, it is known that acids invert or kill the grain of sucrose (cane sugar), while alkalies produce decomposition with the production of colour. Thus, to get *any* required result with sugar, it is essential that it is of the right PH, neither too acid to weaken it, nor alkaline to produce coloration. How often has it been found that two batches appearing identical in every way do not give the same result! How often do sugars of identically the same brand give different results when boiled to the same degree! The application of the hydrogen ion concentration theory offers an explanation for these variations, and what is more important, provides a remedy to obviate these discrepancies and overcome them.

Gelatine

Take another example—Gelatine. It has been found that the gel strength of gelatine varies with the PH. A solution of gelatine is at its maximum gel strength at a PH of 4·7 and weakest at PH 2. Thus, to obtain the maximum efficiency of gelatine it would seem essential to have it at the ideal PH. Again, in practice, it is noticed that sometimes a solution of gelatine is turbid, and this turbidity cannot be removed by filtration. This was thought to be due to the inferior quality of the product. It has, however, been found that this turbidity is more often than not due to the PH of the solution. A solution of gelatine at PH 5 can be quite turbid, whereas the same identical solution at PH 3·5 is quite clear. Thus, by the simple juggling with the PH of the solution, many difficulties can be overcome and improved results can be achieved.

Every Man a Technician

These are just simple explanatory examples, but with the aid of the researches at present being undertaken a time will come when the application of PH will be as common in the factory as in the laboratory. It will not be necessary to wait for the batch to be finished before knowing whether it is a success or failure. The result to expect will be known beforehand in every case. Those factors which now enter into manufacture, and are constantly causing trouble through our lack of knowledge how to counteract them, will be adjusted beforehand. The "strong" and "weak" sugar bogey of the old time sugar boiler will be gone; he will laugh at the thought of a "dud" batch, and be proud that he can then control what before was his bitter enemy. The dissipation of technical knowledge throughout the factory will revive that spark of enthusiasm and add more improvement and quality to the goods than all the highly mechanised mass production machinery can do. To tell a man "the reason why" and so allow him to become an active member in your manufacture instead of a passive operator is a development of the future which will have far-reaching results. Everyone will be a technician in his own sphere and not just a craftsman as we now know him.

Sugars

Again, there are many sugars known to science outside sucrose. These will be brought into use in confectionery and help us to produce those wonderful "new lines" the employers dream about, but which the employé fails to produce. There is a vast amount of work which has been done, and is being done on sugars. What the manufacturer of the future must do is to encourage the application of these results to industry—to his own specific case. Get the results translated from cubic centimetres to pounds of candy. This is where England has fallen behind in the international race—the industrial and scientific communities live too much apart, and not sufficient application is made of scientific discoveries. Both industrialist and scientist are to blame, but the manufacturer of the future will be sufficiently scientific to be on speaking terms with the chemist, and the chemist will be sufficiently commercial to translate his results in terms palatable to the manufacturer and produce that harmony which is now dawning.

Flavouring Matter

The scope for improvement in this direction is limited, yet vast. The ideal to aim at is the reproduction of those flavours nature supplies, without losing that fruity lusciousness and freshness found in the natural fruit. The manufacture of confectionery essences is still hampered by lack of knowledge of fruit distillation, and the reproduction of those delicate "volatiles" by synthetics. In many cases to-day were it not for the colouring of the confection and the label on the box, it would be difficult to give a rough guess at the supposed flavour. The perception of taste, stimulated by the colour of the goods, is greater than one imagines. If at some future time, the addition of colouring matter to confectionery is prohibited, the confectioner will have the full onus of classifying his products, thrown on the flavour, without the aid of that subtle nerve sensitising asset—colour. Hence, improvement in flavouring matter is something of the future which is badly needed.

Package

The work being done to find an ideal packing for chocolate and confectionery will, we hope, produce something which will eliminate all troubles and give assurance that the consumer gets his goods in the state they left the manufacturer. Our present knowledge on package does not extend very far. We want a box which, while allowing reasonable interchange of air, will eliminate those humidity defects we all know about—and the future will produce it for us. Some scientists say this will not be necessary, as in the future they will be able to control the *weather*. But the confectionery and chocolate manufacturer would do well to give his consideration and encouragement to finding a new package in case these "King Canutes of the Weather" fail us.

New Markets

Finally, what of new markets? This, perhaps, is the most important. What new markets can be

expected in the future? Can science be of any assistance in this direction? Indirectly, yes. The development of the home market in face of keen competition can only be done by sheer improvement of the product, and so develop a wider circulation and increased demand. The consumption of chocolate and candy must become, and will become, as in America, part of the daily menu—a necessity and not a casual luxury. And we will not have "Prohibition" to aid this development—it must be a personal achievement of the confectionery manufacturer, and not an off-shoot of legislation.

And as to exportation to unexplored markets. We must first know how to make the goods before we attempt to export them. Will research be able to produce a chocolate which will withstand the hot climates of India and Africa, yet still be of a melting point below body heat, to make it edible? It seems a contradiction to expect to make chocolate which will "stand up" to a temperature of 120° F., yet which will melt at body heat during consumption. Improbable, yes; but impossible—the future will tell. And if such a chocolate can be produced, the market is unlimited.

Science and Industry

And where does all this lead to? Surely the future holds out great prospects for the confectionery industry. We know what we want, and we have the initiative to go ahead. The Cocoa and Chocolate Research Association is doing much pioneer work for the development of future prosperity of the industry. The walls enclosing the factory laboratory are being removed, and the laboratory becoming part and parcel of the factory. The title "chemist" (carrying with it, as it still does, that old idea of a retailer of tooth brushes, pills, and sponges) must be replaced in the factory by "technical supervisor" or "technical manager." The scientist of the future must put all his cards on the table and show what he can do for industry, and the manufacturer on his part, must encourage the application of science to his industry, and be prepared to give it its due.

Science and industry are as essential to one another as Capital is to Labour, and the future will prove it. They can be likened to the two equal sides of a triangle mounted on a common base. The apex of that triangle is the high water mark of efficiency. The more obtuse the angle, and the further the sides are apart, the lower the apex of efficiency becomes. But as science and industry put all their weight into bringing these two sides closer together, the apex slowly rises, efficiency increases, until both sides ultimately coincide and become as one; the maximum will be reached—the achievement of a common aim, with a common incentive—Progress!

Forthcoming Exhibitions

CHOCOLATE AND CONFECTIONERY EXHIBITION.—Olympia, London, W.14, July 9 to 17. Apply to Manufacturing Confectioners' Alliance, Inc., 22, Buckingham Gate, S.W.1.

WORLD DAIRY CONGRESS EXHIBITION.—Nottingham, July 10 to 14. Apply to A. D. Allen, Esq., O.B.E., 28, Russell Square, London, W.C.1.

INTERNATIONAL CONFECTIONERS' AND BAKERS' EXHIBITION (32ND).—Agricultural Hall, Islington, London, N.1, September 8 to 14. Apply to Trades' Markets and Exhibitions, Ltd., 11, Queen Victoria Street, E.C.4.

INTERNATIONAL GROCERS', PROVISION DEALERS', AND ALLIED TRADES' EXHIBITION (32ND). — Agricultural Hall, Islington, London, N.1, September 22 to 28. Apply to Trades' Markets and Exhibitions, Ltd., 11, Queen Victoria Street, E.C.4.

WINES, SPIRITS, AND ALLIED TRADES' EXHIBITION.—London, October or November, for 10 days. Apply to Leslie Gross, Esq., 175, Piccadilly, W.1.

IMPERIAL FRUIT SHOW (8TH).—Manchester (Belle Vue Gardens), October 19 to 27. Apply to J. F. Tamblyn, Esq., 5, Bloomsbury Square, London, W.C.1.

BREWERS' EXHIBITION AND MARKET.—Agricultural Hall, Islington, London, N.1, November 3 to 9. Apply to Messrs. Dale, Reynolds and Co., 46, Cannon Street, E.C.4.

CANADIAN NATIONAL EXHIBITION.—Toronto, August 25 to September 8. Apply to Federation of British Industries, 39, St. James's Street, London, S.W.1.

UNIVERSAL COOKERY AND FOOD EXHIBITION (*including hotel, restaurant, and club equipment*).—Olympia, London, November 23 to December 1. Apply to Secretary, 108, Victoria Street, London, S.W.1.

* * *

International Confectioners' and Bakers' Exhibition.—Mr. Rogers has issued the following notice: "The Railway Companies inform us that they will be running the usual excursion trains to London during the period of the above Exhibition, but as members of an association often prefer to travel together and as the times at which excursions are run are not always suitable, I am venturing to remind you of the concession which the Railway Companies make to parties of not less than twelve. It has been suggested that a special train might be arranged for the larger centres, some of the smaller centres joining up. In some cases, of course, a special association train has been run for some years past.

In view of the increasing interest which takes place annually in the Exhibition and in the absence this year of any disturbing factors, such as railway strikes, Wembley, etc., a larger attendance than ever is expected."

The Salmon Canning Industry

By ERNEST D. CLARK, M.A., Ph.D., DIRECTOR,

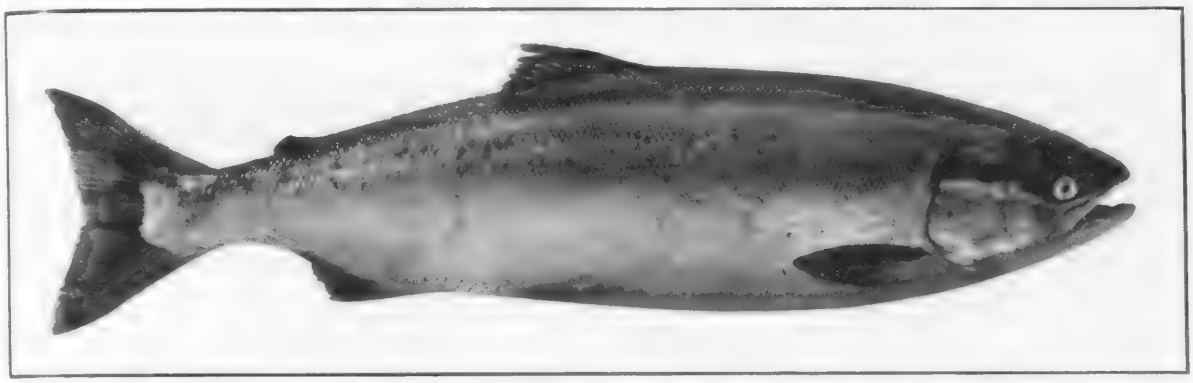
AND

RAY W. CLOUGH, M.A., Ph.D., CHEMIST,

North-West Branch, National Canners' Association, Seattle, Washington, U.S.A.

Having dealt with the life-history of the salmon, the methods employed in its capture, and the plant and processes used at the Western Canneries, the authors proceed to a description of the characteristics of the different species of the fish.

PART III.—THE SPECIES OF PACIFIC SALMON



The Red, Sockeye, or Blueback Salmon, which forms about 35 per cent. of the World's Pack of Canned Salmon.

AS EARLY as 1731 the Pacific salmons were recognised by Steller as distinct from the Atlantic salmon, and the five species were distinguished from one another by the use of their Russian vernacular names, which were later adopted in a scientific nomenclature by Walbaum in 1792. In addition to the scientific name, each of the five species has several common or local names, which makes it rather confusing. Since more than one name may be applied to the same kind of canned salmon, the table in next column is given for the purpose of clearing up this point.

The same names are used in British Columbia, for the most part, as are used on Puget Sound, although at times they also use the name "Blueback" for their best grade of coho salmon.

These five species of Oncorhynchus, while zoologically rather closely related, differ greatly in structure, in size, in the duration of their life cycle, in the behaviour of the young fish, and in the character of the food of the adult. They vary from an average of five pounds or less for the pink salmon to an average of thirty or more for the king, with some specimens of the latter weighing over one hundred pounds. The pink salmon lives but two years, while the king may live six or seven. The young of some species stay but a few weeks in fresh water, going down to the ocean as tiny fish hardly more than an inch in length, while the young of others linger in fresh water lake and stream until their second or even third year, when they are several inches long and better able to look out for themselves in the great ocean. Some species eat other smaller fish, while the other species live largely on microscopic plants and animals forming the plankton of the ocean.

The appearance and life history of the five species

SCIENTIFIC AND LOCAL NAMES OF THE DIFFERENT SPECIES OF SALMON AND THE STEELHEAD TROUT.

Scientific Name.	*On Puget Sound.*	*On Columbia River.*	*In Alaska.*	*Other Names.**
Oncorhynchus. nerka.	Sockeye	Blueback.	Alaska red (sockeye).	Quinault, redfish, red salmon.
Oncorhynchus tschawytscha.	Spring.	Chinook.	King (chinook).	Tyee, quinnat.
Oncorhynchus kisutch.	Coho, silver.	Silver.	Medium red, coho.	Silversides.
Oncorhynchus gorbuscha.	Pink.	Pink.	Pink.	Humpback.
Oncorhynchus keta.	Chum.	Chum.	Chum, keta.	Dog, calico.
Salmo gairdneri.		Steelhead trout.		
Salmo salar.		Atlantic salmon.		

* Names sometimes applied by fishermen to the fish as caught but seldom or never used for the canned product.

differ so greatly that it will be interesting to study each somewhat in detail.

The Chinook or King Salmon

The largest of these well deserves the name of "King" salmon, since it averages twenty-two pounds in weight, while many individuals weigh forty to fifty pounds, and a few of one hundred, or even more, are sometimes taken. Such fish are magnificent creatures, four feet in length, with a graceful body and bright silvery colour, with round black spots on the back and tail. The flesh is usually a bright red, but may vary from that through all gradation to white. A few specimens have been found having both red and white flesh—one side being red and the other white, or red at one end fading out to white at the other, or variously mottled.

The Chinook salmon is found from Central California along the coast of the North Pacific Ocean to Southern Siberia, but in the latter place it forms only about one-third of 1 per cent. of their catch of all species. Two-thirds of the world's pack of king salmon is obtained on the Columbia River, where it is known as the "Chinook" salmon. In addition, a large number are salted and smoked or sold in the fresh fish market. These various outlets result in such a demand for this fish that the price to the fishermen is very high, 12 cents or more a pound, amounting to as much as five or six dollars for a single fish. On account of the high cost of the raw material, chinook canned salmon is very carefully graded as to colour into three or four grades, and most of it is hand packed. Its flesh is very rich in oil, and, therefore, high in food value. It should be used in salads and for similar dishes where its good colour will show to advantage rather than for cooked dishes, for which the lighter coloured and cheaper species are more suitable.

The Red or Sockeye Salmon

Red salmon, which is also known as sockeye (Indian name) and blueback, is well suited to canning on account of its firm texture, which enables it to stand up well under severe shipping conditions. It is a much smaller fish than the chinook, averaging about six pounds, and requiring from ten to fifteen fish to fill a case of forty-eight one-pound cans. It is found all the way from the Columbia River to Siberia, the bulk of the world's pack of this species now coming from Bristol Bay, Alaska, although twenty years ago the Frazer River and Puget Sound were the principal sources.

The red salmon is seldom found in a river which does not have accessible lakes in its watershed, since it seems to prefer to spawn in lakes or in streams flowing into them. It matures in the fourth or fifth year as a rule, some streams having a large proportion of four-year fish and some predominating in five-year.

The red salmon is excellent for salads, or to eat cold right from the cans, its dark red colour forming a pleasing contrast with the green of lettuce or other garnishings.

For many years the red salmon formed the bulk of the world's pack until people everywhere became so accustomed to its deep red colour that they came to believe that unless the salmon they purchased had this colour it could not be salmon. Therefore, when the increasing demand for salmon in the world's market overtaxed the supply of red salmon and necessitated the packing of the lighter coloured species, considerable difficulty was experienced in marketing them.

Canned Salmon never Artificially Coloured

Various tales came into circulation indicating that other and inferior fish were being substituted for salmon. Some of these stories still persist, and are given circulation by publications which should know better. The food laws of the United States and Canada are very strict, and no substitution is allowed; even the different species of salmon themselves may not be substituted for each other. It is also rumoured from time to time that light coloured fish are being dyed to imitate red salmon. Such rumours spring from people who do not know the practical impossibility of dyeing fish flesh to simulate salmon correctly. If it could be done the cost of treatment would more than destroy any profit to be made by the deception. To offset these rumours it is only necessary to acquaint people with the five species of salmon and their characteristics.

The Medium Red or Coho Salmon

The medium red salmon, Indian name Coho, receives its name from the colour of the flesh, which is somewhat lighter than that of the red salmon, but still of a well-defined red. It is also known as the silver salmon on account of its bright silvery appearance in the spring. Its average weight is about seven pounds, but specimens up to thirty pounds are sometimes taken. From nine to eleven fish are required to fill a case. This fish is most abundant from Puget Sound to South-Eastern Alaska, but has a much wider range. A very few are found along the Siberian Coast, where they form less than 1 per cent. of the catch. It matures in three years.

The Pink Salmon

Smallest of all the salmon is the pink, which averages about four pounds, and seldom weighs over eight. Its small size is probably due largely to the fact that it matures in two years, whereas the other species take from three to six. A well-defined cycle has developed on Puget Sound, where each odd year there is a large run of these fish, while on the even years very few come in to spawn, so few that most of the canneries do not open at all.

In the early days of the industry the pink salmon was disregarded, and if accidentally caught in the traps or nets with the red, was used as fertiliser or permitted to go to waste altogether. However, after a few cases were packed and put on the market, a growing appreciation of its high food value and delicate flavour, together with its low price, has so increased the demand that it now forms about 45 per cent. of the total American pack of salmon. About

A Typical Salmon Cannery, Fishing Plant, and Homes of Fishermen on Skeena River, B.C.

fourteen to twenty fish are required for a case, and when it is remembered that 3,300,000 cases of forty-eight one-pound cans were packed in the United States and Alaska in 1926, it is readily seen that some sixty million pink salmon were required. About the same number are caught on the Siberian Coast, but they are, for the most part, salted and sold in Japan, Siberia, and China for a low price.

Many people who are familiar with the five species of salmon like the delicate flavour of good quality pink salmon as well as that of the red. Some parcels are very rich in oil, but on the whole they average less than the king, red, or coho. The pink salmon is excellent in any number of cooked dishes, such as baked salmon loaf, scalloped salmon, etc. Properly seasoned, it makes a delicious sandwich spread. It is as high in protein, tissue-building material, as the more expensive species and is more economical than most animal foods in common use.

Chum or Keta Salmon

Esteemed by the Indians as particularly suitable for drying and by many fishermen as equal to, or better than, the other species for eating fresh, the chum salmon becomes, when canned, the cheapest of the five species. This is due largely to the fact that it has little colour and as a rule is low in oil. However, when caught early in the spawning migration, the flesh possesses a light pink colour, a very firm texture, and sometimes more oil than the average red salmon. Although canned in increasing quantities to compete in markets which demand a cheap article of food it does not prove very profitable for the canner since it is sold at just about the cost of production and at times below.

The chum salmon returns for spawning in its fourth year, and averages about eight pounds, although occasionally one reaches double that weight. It has a wide distribution, being found in nearly all the coastal rivers from Central California around the vast northern sweep of the Pacific to Northern Japan. It forms about one-third of the total salmon catch of Siberia, but only eleven per cent. of its canned salmon pack, since it is much esteemed for salting. On the other hand, most of the commercial catch in the United States, Canada, and Alaska is

canned, and commands a ready sale. The principal runs of this species come rather late in the summer, and these fish do not proceed far up the rivers, but spawn relatively near salt water, to which the young proceed shortly after hatching. However, some of the early chum salmon travel hundreds of miles up the Yukon and other large rivers to spawn, and are eagerly caught by the natives. On account of the absence of colour the canned chum salmon is best employed in cooked dishes of various kinds. Well seasoned, it forms the basis of delicious dishes, and has the further advantage of being very economical. From the standpoint of food value, it ranks somewhat lower than the other species, on account of the lack of oil, but its protein content is fully as high, and this makes it a valuable food.

The Steelhead Trout

Salmo gairdneri, the Steelhead trout, probably so called on account of its exceptionally hard and strong skull, is sometimes classed as a salmon, although it belongs to a different genus than the Pacific salmons. This fish takes the hook readily, and furnishes much sport as well as commercial fishing. It is a gamey fish, putting up a big fight for its life and giving the angler considerable cause for pride when he finally lands it. The average weight in different localities is placed at from eight to fifteen pounds, while individuals of thirty pounds or more are occasionally caught. Like the Atlantic salmon, to which it is rather closely related, it does not always die after spawning, but returns to salt water, and may spawn several times.

Its flesh is rich in oil, and it is highly prized for the fresh and frozen markets, but, owing to its relative lack of colour, very little is preserved by canning. It is most abundant on the Columbia River, but is found in many other localities, and its range is being gradually extended by liberating the young steelheads in new rivers and streams.

Brailing a Salmon Trap, South-Eastern Alaska.

The Pineapple Canning Industry

THE AUTHORS condemn the present highly uneconomical methods in vogue in the pineapple canning industry of Malay, the process being antiquated when compared with those in use at Hawaii. Valuable suggestions are brought forward in order to utilise and turn to profit the large quantities of waste materials of the industry which are now discarded; on an average, the waste products amount to twice the weight of the canned fruit. The waste materials consist mainly of skins, cores, and undesirable fruits, such as unripe, overripe, and decomposing fruit. Recently these waste products have been subjected to chemical analysis, the dried material was found to consist of sugar, proteins, fibrous matter, cores, skins, and organic acids. The author suggests that the waste products could be so treated at a low cost in order to produce a valuable agent, a source of alcohol, or serve as a basis for the production of a native beverage by fermenting.

Hawaii pineapple growers produce a cattle food from the waste products which contains 3·6 per cent. proteins, 12 per cent. sugar, and 18 per cent. fibrous matter and 42 per cent. starch. It is claimed that, by ignition, a fertiliser is obtained which contains 25 per cent. potash and 6 per cent. phosphoric acid.

Malayan pineapple growers are studying the whole question of the economic aspects of the industry and possible outlets for the efficient treatment and disposal of the waste products of the industry.

Abstract from "Agricultural Journal of Malay," 1928, vol. 16, pp. 8-13.

Factors Influencing the Baking Properties of Flour

By T. H. FAIRBROTHER, M.Sc., F.I.C.,
Chief Chemist, McDougalls, Ltd., Millwall Docks, E. 14.

PART III.—THE COLOUR OF FLOUR

AFTER THE volume of the loaf and the texture of the crumb, the colour of the bread is the next important factor to be considered. Experience shows that there is an overwhelming demand for white or creamy loaves with a good rich bloom. The average consumer likes a loaf which is nicely browned on the outside and which has a clear white interior. The brownness of the crust is not due to brown flour, but to caramelisation of the sugar in the flour. The recent cult for "brown" bread makes the provision of flour a simpler matter for some millers, because particles of offal such as bran or husk are regarded as part of the "tout ensemble" of a brown or wholemeal flour, but must be rigidly excluded from a white flour, otherwise the colour would be ruined.

Careful milling is a most important factor influencing the colour of flour. Any possibility of the presence of offals in the flour must be guarded against by a careful selection and upkeep of the sifting silks, and an adequate purification system must be maintained so that any undesirable particles of offal will be removed by efficient aspiration. The size of the particles has an influence on the colour of the dry flour, but the effect of granulation is mainly physical and is largely due to the difference in the refraction of light in the endosperm cells and in the air surrounding the cells. This effect is obviously more noticeable in dry flour and is not so important in the wet or in dough, and whilst it may have an influence on the selling value of a dry flour, it has not a very great influence on the colour of the bread produced.

Clean Milling

Clean milling has also a big influence on the baking value of flour. Wheat, on arrival at the mill, invariably contains many foreign seeds, some of which are black or dark in colour. The seed coat of corn cockle is heavily pigmented, and when milled with wheat may cause black specks to appear in the flour, and a number of such specks will produce a general grey effect. This also occurs with the seeds of the wild vetch, which, in addition, contain a rich yellow pigment detrimental to the colour of the flour. Other seeds have been known to cause red or violet spots in flour, and such foreign seeds must be carefully removed by an elaborate screening process. Some wheats are contaminated with smut, a fungus which grows in the interior of the growing plant and forms blackish powdery spores. Often the ears which should be full of clean wholesome grain are mere masses of these black spores. Smut and rust can, to some extent, be removed by careful screening and washing, but there is always a danger of spoiling the colour of the flour if smutty wheat is used at all. The importance of clean and careful milling as a factor influencing the baking properties of flour is thus clearly seen.

Apart from the question of colour, the influence of clean milling extends further—it affects the keeping properties of flour in so far as the avoidance of mildew or the development of acarids is concerned.

Bleaching

Another factor influencing the colour of flour is the presence of carotinoid pigments in flour. Monier Williams, in a report to the Local Government Board in 1912, suggested that the yellow pigment of flour was mainly carotin, and this substance has been largely studied by other experimenters, but its constitution has not yet been determined. As the carotin can be extracted by petroleum ether or other similar spirits giving a yellow solution, a method has been based on this whereby a permanent record of the colour of flours may be obtained. This method was first elaborated in America, and a modification of the method has recently been developed in this country by Kent Jones. Stockholm, in 1920, showed the good effect on the colour of flour by removing the carotin by ether, but obviously such an extraction is not practicable on a large scale.

It has been definitely shown that the carotin content diminishes when the flour is stored for several months, and also that flour exposed to the air bleaches more than that kept in a closed vessel. This led, naturally, to the idea that the bleaching of flour brought about by a natural ageing was merely a process of oxidation, and methods were developed to supplement the natural ageing by chemical processes of oxidation. Whether the whole of the changes which take place during the ageing of flour can be attributed entirely to oxidation or not, it is certain that the improvement in colour is generally brought about by oxidising agents. The artificial bleaching of flour, as brought about by chlorine, nitrogen peroxide, benzoyl peroxide, etc., may be regarded as an acceleration of the processes which would occur naturally on exposure of the flour to the air. Artificial bleaching cannot cover up dirty milling, and would certainly not prevent the discovery of foreign particles in the flour. Bleaching in some form or other, whether by the slow, natural method or by the more accelerated chemical methods, is carried out in most flour mills, and the only result that can be obtained from this process is a removal by oxidation of the yellow pigments present in the

natural endosperm. The grey colour due to dirt and foreign particles is not removed by bleaching, and frequently the colour of a dirty flour is made worse by bleaching.

Influence of Improvers on Baking Properties

In addition to improving the colour of flour chemical substances may be added to flour to enhance its natural baking qualities by supplementing deficiencies or correcting conditions which impair its capacity for yielding loaves of the volume, shape, and texture desired. These substances are known to the milling industry as "improvers," and are more frequently added by the baker than the miller. Improvers are frequently confused with bleaching agents as often the same substance bleaches as well as improves.

Improvers are concerned with the problem of making the gluten content function to its fullest extent. The behaviour of gluten is conditioned by the quantity and character of the electrolytes present, and as the iso-electric point of both gliadin and glutenin is about pH 6·5 to 7·0, any substantial departure from this range will have an effect on the baking properties. As dough is normally rich in mineral salts, such as sodium chloride, it is not likely that the addition of similar salts will have much influence, but the addition of salts which give trivalent ions, such as PO_4 or Al, will effect a measurable modification of the dough properties, and, as a result, phosphates have been largely used as improvers. As flour and yeast naturally contain phosphate it does not appear that the addition of such improvers will be harmful.

How the improvers act is still a matter of conjecture—they seem to work in two directions, alteration of acidity and as oxidising agents.

The amount used in some cases such as the bromates (1 in 40,000) is so small that the action can scarcely be regarded as chemical, and in all probability some calalytic influence on the colloidal properties of the gluten constituents is the nature of the action.

The function of malt extract as an improver is more readily understood. It is rich in diastase and this assists the yeast in gas production. The recent discovery by Kent Jones that overheated wheat acts as an improver is also difficult to explain. It is certain, however, that to produce good, standard loaves from all flours some assistance must be available. If a flour contains naturally all those agencies which will allow of the production of a good loaf, no addition is necessary. If, however, the flour, correct in most directions, is deficient in some small detail, this should be corrected by artificial agents which will not harm the flour in any way from a nutritive or digestive point of view.

Conclusion

The factors influencing the baking properties of flour may be summarised as chemical, biochemical, physical, and manipulative. The chemical factors involve the understanding of the protein content and the chemical changes which influence this content, the chemical actions which will oxidise the pigments and produce flour of standard whiteness, and those which induce the gluten to function correctly. The biochemical factors involve the life and action of yeast, the function of certain enzymes which influence the diastasic activity and provide yeast foods. The physical factors involve a knowledge of the viscosity and colloidal properties of gluten, the size of particle, the effect of humidity during milling and storage; and finally the manipulative factors are concerned with clean milling and the handling of the flour and dough in the baking processes.

A complete understanding of all these factors will lead ultimately to the real standard bread.

The Effect of Metals on Milk

By W. E. Warner

Metals which have to be in contact with milk must be carefully chosen, as some metals have a harmful effect. Pure tin, or steel which has a heavy coating of tin, is the most satisfactory metal to use, tin having less effect on the taste of milk than any other metal. Other satisfactory metals are monel metal, nickel, aluminium and chromium iron. These affect the taste more than tin, but are slightly less affected by corrosion. Copper, and alloys containing a high percentage of copper, are the least satisfactory metals. They affect the taste and also promote bacterial growth and souring; objectionable slimes may be produced due to the metallic lactates combining with the casein and displacing the calcium. The corrosion of any container, however slight, is objectionable, as the pits formed cause difficulty when cleaning and disinfecting. Aluminium is corroded by the alkalies present in washing compounds which may be employed for scouring; if these compounds are used, then a small amount of sodium silicate should be added, and this will effectively prevent corrosion.

The Changes Produced in Meat Extracts by the "Bacterium Staphylococcus."

("*Food Investigation Special Report*," *No.* 31, 1928. *Dept. of Scientific and Indus. Research, London.*)

A study has been made of methods for classification of the degradation products of protein decomposition in meat extracts due to bacterial activity. A relationship has been established between the fluctuation in organisms from a numerical standpoint and the rapidity of change of particular groups of substances, the changes being studied over a prolonged period, often over several days; previously, investigations of this character have been confined to a relatively short period of time. The methods are of wide application and are applicable to many fields of biological research.

Canning Research

The following is extracted from Bulletin No. 103-A, "Scientific Research Applied to the Canning Industry," which has recently been issued by the National Canners Association, Washington, D.C.

PART IV

THROUGH COLLABORATION with institutions prominent in the field of chemistry, bacteriology, and physiology, the Association has assisted in the development of new information on the nutritive value and wholesomeness of canned foods.

The laboratory at Seattle has also conducted a comprehensive study of the food value of the five species of salmon and of steelhead trout from the five principal districts where these products are canned. An investigation was also made of the iodine content, which was found to be very high, indicating the value of this food in the treatment and prevention of goitre.

Vitamins in Canned Foods

Perhaps the simplest and most comprehensive statement regarding the nutritive value of canned foods is that canned foods are simply cooked foods, and have the wholesomeness and nutritive value of the freshly cooked food. For a time it was assumed by many that the vitamins in foods were destroyed by the canning process. This has been found to be incorrect.

During the last half-dozen years an extensive study of this subject has been made by the Department of Physiological Chemistry of Teachers College, Columbia University, in collaboration with the National Canners Association. This study included vitamins A, B, and C. It was found that no appreciable reduction was made in either vitamin A or B, and the amount of those vitamins in the canned product is substantially the same as in the raw product. Home cooking also was found to be without appreciable influence on vitamins A and B.

Vitamin C has always been supposed to be very sensitive to heat. This work has shown, however, that it is not particularly sensitive to heat in the absence of oxygen. It is destroyed by oxygen even at cold-storage temperatures, and since this destruction is a chemical action it increases with temperature and, of course, becomes very rapid at cooking temperatures. A portion of vitamin C is destroyed by cooking in open kettles. It was not found possible in making this comparison to use exactly the same product for testing in the raw state or for home cooking as was used for canning. The canned foods were prepared from raw products grown for canning and canned promptly after harvesting, as is usual in the industry. The foods tested at Teachers College in the raw state and after home cooking were obtained in the city markets, since it was only there that it was practicable to obtain them. In general, it was found that the amount of vitamin C in the canned product was at least four times as great as the amount in the home-cooked food prepared from the raw product obtained from the city market.

So-called Ptomaine Poisoning

Soon after the organisation of the National Canners Association in 1907 the canning industry became gravely concerned over the frequent notices of so-called "ptomaine poisoning" attributed in the public Press to canned foods. It was, therefore, decided to investigate these statements to determine their accuracy. From that time to the present, inquiries have been made regarding all published announcements of illness or death attributed to canned foods. Usually the investigation showed at once that the announcement was incorrect. All reports which were not obviously unfounded were subjected to competent medical and scientific study.

For this purpose the Association succeeded in interesting Dr. Robert S. Page, a competent physician trained in bacteriology. To Dr. Page belongs the credit for laying the foundation for the broad and fundamental researches which have been conducted. He outlined the method that should be followed in studying the cases reported, and prepared questions which should be asked the family of the patients and the attending physicians. For nearly ten years he personally investigated all cases of illness alleged to be caused by canned foods which seemed to require the attention of one trained in medical or scientific lines.

When the research laboratories of the National Canners Association were organised in 1913 it was contemplated that a systematic study of food poisoning should be undertaken. It was felt, however, that the laboratories should devote their time especially to technological studies. Attempts were therefore made to have a systematic study of food poisoning undertaken by one of the Government laboratories or under the direction of members of the faculty of one of the leading medical schools. These attempts were unsuccessful until 1916. That year the National Research Council was organised, and at the request of the National Canners Association, the Council organised an investigation of food poisoning under the direction of Dr. M. J. Rosenau, head of the Department of Preventive Medicine and Hygiene of Harvard University Medical School, with an advisory board of six men from several universities prominent in the fields of chemistry, bacteriology, and physiology. This work was organised early in 1917. It was supported by funds provided by the National Canners Association, and the results of the investigations were published in a series of articles in scientific journals.

It was announced by Dr. Rosenau as a result of these investigations that they had been unable to find any evidence that ptomaines would produce illness in human beings when taken by mouth.

Perhaps the most important outcome of Dr.

Rosenau's work was the influence it has had in the statements contained in textbooks on preventive medicine. Books used in medical schools at the time his work was done contained statements that the increased use of canned foods in recent years had augmented the number of outbreaks of food poisoning, and the suggestion was also made that they might be a factor in nervous and intestinal diseases. These statements were entirely without foundation. The articles resulting from Dr. Rosenau's work called attention to the fact that these statements were erroneous, and medical books issued since that time, as far as they have come under observation, do not contain such statements. As a result of this work Dr. Rosenau, in repeated articles, called attention to the fact that because of their method of preparation canned foods are not subject to contamination by bacteria as in case of foods stored in bulk, and for that reason are "the safest foods that come to your table." Dr. Rosenau's investigation on the general subject of food poisoning was closed in 1920, after three years' work. He then devoted two years to the study of botulism.

For several years Dr. E. O. Jordan, of the University of Chicago, has conducted investigations on the general subject of food poisoning, giving his special attention to bacteria of the paratyphoid group. He has directed the work of several well-qualified investigators, and has studied the outbreaks of food poisoning that have occurred in Central and Eastern United States. He concurs with Dr. Rosenau in the finding that such outbreaks are rarely caused by canned foods unless such foods become contaminated after the can is opened.

Botulism

Botulism has been known for several hundred years in Continental Europe under the name of meat poisoning. The causative micro-organism was isolated first in Belgium under the name of B. botulinus. Few cases of botulism occurred in this country until 1913, when there was an outbreak at Stanford University, California, from string beans packed by home-canning methods. This started investigations which were carried on in a relatively small way until 1919, when the first outbreaks recognised as due to commercially canned foods occurred. Before this time it was realised by the research laboratories that outbreaks were possible, and the work on heat penetration and heat-resistance of bacteria was planned in part to safeguard against botulism. It was hoped that these processing studies might proceed far enough to insure the adequacy of commercial processes before there was an outbreak of botulism from commercially canned foods. In this the laboratories were disappointed, and the outbreaks in 1919 led to the organisation of an intensive study of this subject.

As already mentioned, the work of Dr. Rosenau, of Harvard University, on the general subject of food poisoning was diverted to a special study of botulism. An investigation was also organised and conducted by Dr. K. F. Meyer, of the University of California; Dr. E. C. Dickson, of Stanford University; and Dr. J. C. Geiger, epidemiologist of the U.S. Public Health Service, who was detailed to act as epidemiologist of the investigation. This intensive study was conducted for two years, and the report was published as a bulletin of the United States Public Health Service.

As already stated, the methods that had been developed by the research laboratories on the heat penetration of canned foods and heat resistance of bacteria were fundamental to the investigation, and the laboratories' bacteriologists took charge of that phase of the work. The investigations showed that the botulinus organism will not grow and form its toxin in acid products such as tomatoes, kraut, and the common fruits; also, that foods of lower acidity, such as meat, fish products, and vegetables other than tomatoes, should be processed under pressure. They also showed that the botulinus organism occurs normally in the soil throughout the world.

As soon as the results of the investigation were available the National Canners Association published a popular bulletin on the subject for distribution in the canning industry. The research laboratories also made a careful study of the processes required in all varieties of canned foods to safeguard against the possibility of botulism. A series of circulars has been published and distributed giving processes for a considerable number of foods.

Botulinus investigations are still being conducted by the San Francisco laboratory of the Association in collaboration with the California State Board of Health. The latter body has specified processes that must be used within that state, and has adopted regulations governing equipment and management of retorts in canning plants.

(*Continued from next page.*)

Daily Operating Costs:	*Dollars.*
Daily fixed charge	1·21
Steam	1·98
Labour	16·65
Power and water	nil
	19·84
Unit Costs:	
Per batch	2·48
Per gallon	·0276
Per jar	·0014

In addition to savings in the actual costs of operation other gains are added—namely (1) an increased yield of the finished products; (2) improved flavour, colour, and shape; (3) uniformity of the product; (4) a cleaner plant and also saving of labour.

The average increase in yield for all fruits processed is estimated at 15 per cent., amounting to a saving of 17,694 dollars for the season. The glass-lined vacuum equipment proved easier to clean because the fruit did not burn on to the container at the low processing temperature used.

(*Abstract from "Canning Age."*)

The Cost of Cooking Preserves by the Vacuum Pan

THE DATA given below result from a study made by the A. C. Nielson Co., engineers, in collaboration with W. F. McCarty, General Manager of the Hudson Valley Pure Food Co.

One of the most valuable aids in cooking preserves is to have accurate cost records of the performance of the equipment. Such records, naturally, are helpful chiefly for comparative purposes, for, knowing our costs, it is still necessary to check them against a standard performance. Then if costs are high we have a basis from which to locate trouble. The costs records given below were taken at the Hudson Valley Pure Food Co., Highland Factory, N.Y., before and after the installation of the vacuum process; hence they offer a sound comparison, the processes having been carried out at the same factory under identical conditions. The foods packed included crushed fruits, syrups, jams, and jellies, the packing being extended throughout almost the whole year. The vacuum pans were installed in June, 1926, being of 300-gallon capacity, provided with heating coils, heating jacket, agitator driven by a 2-h.p. motor, and control board with index thermometers, vacuum and steam gauges. The vacuum is provided by a steam-driven vacuum pump, whose exhaust is turned into the pan heating coils in addition to what steam may be required.

This company packs its own strawberries at Norfolk, Virginia, in 50-gallon barrels, with a fruit to sugar ratio of 2:1. They are put under cold storage for transportation and held in refrigerators at the plant at a temperature of 26° F. until used. Raspberries from the Pacific Coast are straight packed with no sugar, and are practically frozen, being kept in an outside storage room at a temperature of 19° F., until used. Pineapple comes from Hawaii, and orange pulp for marmalade from Spain. Strawberries are usually received during May, raspberries during May to July, and pineapple and oranges throughout the year.

The preserves and jams are made in 100-gallon batches. Fruit is taken out of cold storage one day ahead of processing to permit thawing out, being liquid enough after standing a day to allow removal by means of a dipper. Berries are removed from the barrels and the juice drained off in the required quantities. The free juice is placed in the preheater at the normal temperature, sugar added, and the mixture drawn into the pan, where it is concentrated in about twenty minutes to the required density. In the meantime the fruit has been put into the preheater and heated from room temperature to 130° F., while the syrup is concentrating in the pan. The syrup is then dropped over the preheated berries. The batch of berries and juice is then drawn back into the pan and cooked until the refractometer shows it to be done. The temperature in the pan is maintained at 135° F., at a vacuum of twenty-five inches; the time in the pan varies from fifteen to twenty minutes, depending upon the fruit packed. Strawberries are given the shortest treatment in order to preserve their form. The completed product is dropped by gravity from the pan into the aluminium kettle, where it is heated to 190° F. for pasteurisation, and is kept hot until sealed in containers. Allowing ten minutes for drawing the mixture of berries and juice from the preheater to the pan, the time of processing a 100-gallon batch from removal from the barrels until ready for the pasteurising is fifty to sixty minutes.

Table A gives the cost of processing by the vacuum method. The cost of the equipment installed amounted to 3,989 dollars; this is depreciated on the basis of a ten-years' life. Average interest and an estimated allowance for maintenance and repair amount to 630 dollars a year. With the equivalent of about eighty-four days of operation per year, the fixed charge per day of operation is 7·5 dollars.

TABLE A.—COST OF PROCESSING FRUIT IN VACUUM PAN.

	Dollars.
Investment:	
150-gallon preheater	751
300-gallon vacuum pan and pump	2,348
250-gallon pasteurising vessel	550
Installation costs	330
	3,989
Annual Fixed Charges:	
Depreciation	398·9
Interest on outlay at 6 per cent.	131·64
Maintenance	100
	630·54
Daily Operating Costs:	
Daily fixed charge	7·51
Power	1·15
Steam	1·98
Water	·12
Labour	13·5
	24·26
Unit Costs:	
Per average batch	2·695
Per average gallon	·0269
Per jar	·0013

TABLE B.—COST OF PROCESSING FRUIT BY THE OPEN KETTLE METHOD.

Fixed Charges:	
Depreciation	57·5
Interest on outlay	18·98
Maintenance	25·00
	101·48

(*Continued on previous page.*)

Trade News

Correspondence

"DOSE WRAPPERS ARE ON DE LOAVES."

BY A BAKERY MANAGER.

THE article published in the June issue of FOOD MANUFACTURE under the title, "Where are the bread-wrappers?" was a most inaccurate and misleading concoction.

Surely the writer of that article must live in the backwoods of Wigan or have had an attack of the old malady that possessed Rip Van Winkle.

At any rate, I would suggest that "Fred" confine his copy to subjects in accordance with the alphabetical finish attached to his name, then he might be able to give us some useful information upon matters with which he is familiar and thus be of interest to readers of this journal.

Now to get down to hard facts. In the year 1924, the City of Glasgow had an attack of "brains" (not unusual periodically).

This malady affected several hard-headed Scotsmen who, as a pastime, I suppose, supervised the manufacture of bread in two of the largest bread factories in the world.

The infection, spreading at an alarming rate, soon had practically all the Master Bakers under its control, ultimately finishing up with those affected men spending thousands of pounds on installing machinery for the scientific paper wrapping of bread before leaving the bakery.

Those Master Bakers, not being of the same nationality as "Fred," non-philanthropists, informed their customers that the price of bread would be increased by one farthing per 2 lb. loaf, to make up for the expense in connection with wrapping.

We had none of those pathetic "Geggy" touches as given by "Fred," such as "Roundsmen and the Wrappers," and "Poor people and large quantities of bread," "Wealthy customers leaning out of motor-cars indignantly refusing to pay this scandalous tax of one farthing per 2 lb. loaf."

No, sir! this is Scotland, and the true position of affairs is this:

The very few Master Bakers who did not move with the times (four years ago) are now lamenting the loss of their bread trade, brought about by their own stupidity, and in many cases are now installing the necessary machinery.

Bread made in all the factories in and around Glasgow is wrapped in paper wrappers daily before leaving the bakeries. Not only bread, but almost everything made in bakeries here is wrapped in paper, cardboard boxes, or cellophane paper before being exposed for sale. It may seem a bit boastful, but there is an old saying to the effect: "What Glasgow does to-day, London does next week."

It would give me great pleasure to escort "Fred," or any others so minded, through some of our modern bakeries here and let them see for themselves the trouble that has been taken to supply the public with bread, manufactured under the most hygenic conditions possible, AND WRAPPED.

Exhibitions

Chocolate and Confectionery Exhibition.—Messrs. A. Boake, Roberts and Co., Ltd., will make a special display of flavouring essences, harmless colourings, fine chemicals used in flavouring, and essential oils.

World Dairy Congress Exhibition.—The Enamelled Metal Products Corporation, Ltd., will have several stands and an extensive display, including glass-lined equipment for pasteurising, storing, and transporting milk, mixing, pasteurising, and ageing ice-cream, and for the hygienic treatment of cream.

Universal Cookery and Food Exhibition.—A considerable number of firms have recently booked space. Great interest is being taken on the Continent, and it is anticipated that several municipal bodies will take space.

Trade Publications

Imperial Chemical Industries, Ltd., Nobel House, London, S.W.1.—A twenty-page booklet, entitled "The Chlorine Derivatives of Ethane and Ethylene" gives an account of the properties and uses of these products, which are largely used as solvents and degreasing agents. They have numerous other uses, and are non-inflammable.

Enamelled Metal Products Corporation, Ltd., 56, Kingsway, London, W.C.2.—A booklet, No. 602, dealing with "Pfaudler" glass-lined equipment for milk, ice-cream, etc. This includes storage tanks, pasteuriser-holders, and transport tanks for milk, and mixer-pasteurisers and ageing tanks for ice-cream.

* * *

THE International Nickel Co., and G. and J. Weir, Ltd., have agreed to form a new British Company, the "Monel-Weir, Limited," of Cathcart, Glasgow, to take control of the work hitherto done by the Monel Metal Department of G. and J. Weir, Ltd. The new company will operate as from June 1, 1928.

Enquiries

The following are extracts from letters we have lately received. We shall be glad to put interested parties in touch with the writers, or to insert replies in the Correspondence columns.

33. Required, names of three or four prominent firms who would be interested in the preservation of fish by methods other than refrigeration.

34. Required, good Christmas mincemeat recipe, suitable for the public market. What is a cure for fermentation in mincemeat?

35. "We have been endeavouring to cure citron caps, and we find that we are unable to get them sufficiently soft. We have been treating them in exactly the same way that we treat lemon skins, and although we are getting perfectly satisfactory results with the lemon, the citron, as you will see from the sample enclosed, remains distinctly hard in the centre and is, of course, useless.

We shall be glad to know if you can suggest anything in its treatment which will enable us to get this into a soft condition, suitable for eating."

Overseas News

South African Canned Pears

WHAT IS claimed to be a record shipment of canned fruit from South Africa has recently been made in the form of 480,000 cans of pears destined for this country. It is reported that the entire shipment was sold to London before leaving South Africa, thereby completely eliminating the speculative element.

Canned fruit has not been an item of particular activity among the fruit exports of South Africa, but the recent development in shipments such as this recent one and the shipment of 250 tons of canned fruit to New Zealand are held, in some quarters, to be significant of an upward trend in the South African exports of tinned fruits. Cape Town is the principal port of shipment of canned fruits, with the exception of pineapples from Port Elizabeth. The port records indicate a decided drop in canned fruit shipments from Cape Town in 1927 and a very poor year in 1926, 1,341 and 8,942 cases going out in each year, respectively, revealing the extremely small business done in that line overseas.

Fruit Canning in South Africa

According to American Consul C.M.P. Cross, at Capetown, in a report dated March 27, 1928, fruit canning has not been highly successful in South Africa, and is at present confined almost exclusively to meeting the domestic demand. The strength of the South African deciduous fruit position is that it comes on the English market during the winter months, when high prices are obtainable. Costs of production in South Africa are high, and grading difficulties result from the class of labour available.

The bulk of the fruit canned is apricots and pineapples. Most of the fruit is tinned in the form of jams, which enjoy a considerable domestic demand, and are sold at prices with which the imported product finds it difficult to compete.

Dried Fruit Industry of South Africa during 1927

The unsatisfactory character of the deciduous fruit crop was reflected directly in the dried fruit production, according to a report dated March 27, 1928. Fruit drying in South Africa is as yet primarily a side line to absorb surplus and fruit unsuitable for export in a fresh condition.

A very large increase in the production of apricots within a few years is anticipated from the large plantings which have been made. This fruit seems peculiarly adapted to South African conditions, and the yield is good both in quantity and quality. Marked progress has been made in eliminating inferior trees.

Trouble was experienced during the year with the United Kingdom regulations forbidding the importation of apricots with a sulphur dioxide content of more that 2,000 parts per million. Experiments appear to show that a short period of only four hours in strong sulphur fumes is sufficient to give the desired colour and yet keep the percentage below the permitted content.

The sultana yield was considerably less than in 1926, because of the unfavourable climatic conditions. Growers also were very much disturbed by the regulations of the United Kingdom forbidding the importation of sultanas with a sulphur dioxide content of more than 750 parts per million. Experiments were conducted with shade drying without sulphuring, but without complete success. Efforts to induce the English authorities to raise the sulphur content for sultanas to the same level as for other fruit were unsuccessful, and the future of the industry is still uncertain.

The raisin crop was almost a complete failure through climatic conditions. Most of the grapes were made into wine and the exports declined very greatly. No raisins were exported to the United States, largely because of the shortage and partly because of the falling off in the American demand for raisins of the South African type.

Prunes do not appear to do well in South Africa, and many trees are being replaced with apricots. The season of 1927 was a bad one, and the exports declined. Peaches and pears are also dried, but the quantities are comparatively small.

Marking of Prepared Fruits and Vegetables Imported into Canada

The Veterinary Director General of the Department of Agriculture at Ottawa has issued a circular to the Inspectors of the Health of Animals Branch of that Department which is quoted in full below:

"It has been noted that from time to time samples taken from import shipment of canned fruits and vegetables are labelled to use the brand name, but that same is not followed by the word 'brand' or the words 'Trade Mark Registered,' 'Patented,' etc.

"As the manufacturers of canned fruits and vegetables in Canada are required to show such markings, it has been deemed advisable to require that all import shipments of these products received after October 1, 1928, be so labelled.

"This does not refer to the use of a firm name, as a brand name such as 'Doe's' goods showing the name of the firm as John Doe and Company.

"Please be good enough, therefore, to advise all importers that this labelling will be required after October 1, 1928."

Inquiry of Dr. Robert Barnes, Chief of the Meats and Canned Foods Division, U.S.A., has elicited the following explanation of the above instructions:

1. The regulations apply to all kinds of prepared fruits and vegetables imported into Canada, whether in cans or cartons or other containers.

2. If the words "Trade Mark" or "Trade Mark Registered U.S. Patent Office" or simply "Registered U.S. Patent Office" appear on the container in close proximity to the proper description of the contents, such as "White Ribbon Corn—Registered U.S. Patent Office," the word "Brand" need not be added.

German Labelling Decree to be Rigidly Enforced

According to a report of May 2, American Commercial Attaché F. W. Allport, at Berlin, informs the Department of Commerce that a discussion of the question with one of the officials of the German Government, who had been instrumental in preparing the new German Foodstuffs Labelling Decree, elicits the opinion that a rigid enforcement of this decree will be carried out. The decree itself has attracted a great deal of attention, and can scarcely be ignored by the authorities once it has come into force. German products have now been subjected to it for some time, and further exemption of foreign products would create a species of discrimination that would be most embarrassing for the Government.

The most powerful factors in the enforcement of the decree are the dealers themselves. It is thought that they would be unwilling to handle goods that are not marked in complete conformity with the requirements. To do so would expose them to risks that they would be unwilling to run so long as they have nothing particular to gain by doing so. The control exercised throughout Germany in connection with regulations of this type is strict, and consequently is duly feared and respected by German dealers.

Proposed Method for Improving Greek Currants

Prominent members of the raisin market of London have recently submitted to the Currants Autonomous Office at Athens reports concerning the improvement of methods for drying raisins, according to information contained in a recent issue of a trade paper at Athens. The reports stress the necessity of popularising the system of drying raisins on trays or hand barrows, which eliminates the necessity of the British practice of cleaning the fruit before warehousing.

The Autonomous organisation is already busy trying to familiarise the growers with this new method of drying. Very shortly it is expected work will be begun at Patras and Kalamata on the manufacture of approximately 100,000 trays, which will be divided among the co-operatives with facilities for payment arranged.

The above-mentioned reports also point out that large quantities of raisins contain seeds which cause difficulties in the preparation of pastries and raisin bread. The British trade attributes this fact to the advanced age of some of the vines, but it seems that the real cause is to be found in the probable carelessness in the use of phosphorous fertilizers which, according to the report, tend to promote the growth of seeds in the plants.

Canned Milk Imports into Taiwan during 1926

No condensed or evaporated milk is manufactured in Taiwan, according to a report of January 12, 1928, from American Consul C. L. DeVault, at Taihoku, Japan. Imports of canned milks into Taiwan came almost wholly from the United States until within the last seven years. Energetic efforts have been made by English, German, Danish, and Dutch producers to market their canned milk products in Taiwan, but without success. Gradually, and with somewhat inferior products, Japan producers have been able to largely supersede United States products in this line, as is shown by the following statistics abstracted from the official Taiwan Customs returns:

CANNED MILK IMPORTS.

Country of Origin.	1924.	1925.	1926.
	Cases.	*Cases.*	*Cases.*
Japan	66,446	80,004	186,61[illegible]
United States	90,820	65,935	13,26[illegible]
Other countries	15	1,360	2,1[illegible]
Total ...	157,281	157,100	202,0[illegible]

Concession for the Manufacture of Condensed and Evaporated Milk in Peru

Peru's total imports of condensed and evaporated milk, and powdered milk, amounted in 1926 to slightly over 8,800,000 pounds, of which the United States supplied 7,700,000 pounds, or 87 per cent., according to a report of March 31, 1928, from American Vice-Consul E. O. Briggs, at Callao-Lima. (Milk preparations are not separately listed in Peruvian statistics). Holland, the second exporter to this market, sent 635,250 pounds, and Great Britain 248,860 pounds. 90 per cent. of the total was entered at the port of Callao. At the present time these products are on the free list.

The monopoly concession recently approved provides for the establishment of the industry within two years, and that the company shall have a capitalisation of at least $40,000 at current exchange. It is valid for ten years.

The name of the concessionaire is Alfredo Garland Daponte, a Peruvian citizen.

Concentrated Milk Industry of Switzerland during 1927

The decline in the price of raw milk in 1926 helped the industry greatly, and operations are now reported to be bringing in good profits.

Production figures for 1927 are not yet available.

The following table compares output and exports during recent years:

Year.	Short Tons. Production.	Exports.
1913	50,000	44,600
1920	23,000	—
1925	40,000	33,600
1926	44,100	36,800
1927	41,000*	40,500

* Estimated.

No distinction is made in Swiss official statistics between condensed and evaporated milks. Powdered milk also cannot be separated, but it is believed that this represents about 14 per cent. of the total production figures quoted.

An effort has been made to export sterilised milk from the Berne district to the United States, and in 1926 a shipment amounting to about $1,200 in value was made. In 1927, $2,245 worth was exported from that district. It cannot yet be stated whether the industry will be able to develop any real market in the United States for canned sterilised milk, as this form of canned milk is not well known in America.

Again, in 1927, over one-third of the canned milk production was exported to the Straits Settlements, while England (10 per cent.) and France (8 per cent.) were the two other largest individual buyers.

There are no reliable figures to be obtained regarding the carry-over of canned milk stocks, but it is believed that these are very small. The supply of fresh milk is plentiful, and, therefore, there is no occasion for the building up of large stocks.

The domestic production of fresh milk in 1926 was 3,026,000 short tons. The figures for 1927 are not available, but are believed to be about 3,100,000 short tons. Only about 4 per cent., or 121,000 short tons, are used for condensed milk. Obviously, as far as milk is concerned, the condensed milk production is capable of much expansion.

The question of a most profitable outlet for fresh milk does not exist in Switzerland, because a fixed price exists under the organisation of the milk producer's association, at which the local consumer, cheese manufacturer, canned milk producer, and chocolate maker have to buy, and no preference is accorded to any one special industry purchasing milk, which policy, on the whole, tends to gradually reduce the prices of milk products.

Italian Fish Canning

In the Trieste district about twenty-seven establishments are engaged in canning, employing all told 2,000 hands. The G. Arrigoni and Company fish canners at Isola, near Trieste, are the most important in the district, and inaugurated during the year 1927 their new plant, built on very modern lines. They claim the distinction of being the second largest canning factory in Europe.

Its employés in 1926 averaged 1,000 workers. In 1927 they rose to 1,300. The total number of plants now working for the Arrigoni interests totals seven. In 1926 their production was 6,270,000 pounds, of which 4,620,000 pounds were exported. During the year 1927, owing to the new financial situation arising with the revaluation of the lira, sales dropped to 4,290,000 pounds.

U.K. Imports of Canned Foods

The following table, compiled from Custom bills of entry by a firm in the canned goods trade in London

IMPORTS OF CANNED FRUIT INTO THE UNITED KINGDOM, FIRST QUARTER, 1928.

	1926.	1927.	1928.
	Cases.	*Cases.*	*Cases.*
Total Canned Fruit Imports from United States and Canada ...	1,001,744	1,082,767	1,087,832
Canned Fruit. Total ...	902,053	904,759	902,891
Apricots	90,658	111,814	145,372
Peaches	255,474	208,293	282,733
Pears	235,236	254,513	250,381
Fruit Salad ...	113,926	102,872	84,121
Unclassified ...	196,146	223,872	124,521
Berries. Total ...	35,431	85,982	72,464
Incl. Loganberries ...	23,808	64,673	45,451
Grapefruit	5,132	22,167	1,563
Total Canned Fruit Imports from the Continent	6,011	8,841	9,414
Pineapples:			
From Singapore ...	250,838	158,264	248,004
,, U.S.A. and ,, Hawaii ...	30,533	31,478	66,478
,, South Africa	10,163	12,395	6,804
Total ...	291,534	202,437	327,160*
Canned Fruit Pulp:			
Australian ...	1,557	4,476	568
Continental ...	18,940	17,746	28,171
Canned Vegetables:			
Tomatoes	93,858	87,286	105,542
Total from U.S.A. and Canada ...	90,261	76,402	81,614
Incl. Asparagus ...	3,921	4,448	7,898
,, Beans ...	78,450	58,080	59,500
,, Peas ...	379	3,269	4,608
Canned Fish. Total ...	103,134	140,305	187 634
Incl. Prawns ...	5,963	8,558	8,863
,, Pilchards ...	26,291	19,169	20,138

* Includes Hong Kong and others.

and forwarded to the Department of Commerce by American Trade Commissioner James Somerville, Jr., shows the imports of canned foods into the United Kingdom during the first three months of 1928 compared with imports for the same periods of 1926 and 1927. The figures may not be so accurate as the Board of Trade returns, and, therefore, are not so useful for statistical purposes. The percentage difference, however, is not very large and the table is being reprinted to show trends in trade in various commodities. These trends are not shown in the monthly statements of the Board of Trade, since that organisation segregates canned fruits into but two classes, "Canned Pineapple" and "Other Canned Fruit."

These figures at first sight would indicate a considerable increase in imports of canned apricots and peaches. This conclusion, however, is unsafe, since the large unclassified item, which may include any of the other canned fruit items, has been reduced by nearly 50 per cent. This undoubtedly accounts for a part of the increase in the apricot and peach figures, and also explains why the figures for pears, which have been in short supply this year, are almost the same as last year. On the other hand, the fact of this reduction in the unclassified item goes to emphasize the decrease in those items which show a reduced figure, such as fruit salad and loganberries. Imports of fruit salad for the three years show a steady decline for this period. Loganberries, after having shown steady increases in previous years, have fallen back sharply. The most noteworthy percentage decrease is in the case of grapefruit, the imports of which are less than 10 per cent. of those for last year. Evidently, consumption of this item has not yet taken up the slack created by over-imports during 1927. The increase in imports of pineapples appears from these figures to have applied about equally to those from Singapore and Hawaii. Imports from South Africa, on the other hand, have declined sharply.

Imports of canned fruit pulp from the Continent are considerably heavier than they were last year. Imports of tomatoes have likewise increased considerably.

Some quantities of Australian fruits are passing through the market, but reports differ somewhat as to the demand for them. According to a report from one brokerage house, the demand has been disappointing, and it is thought probable that only about one-tenth of the quantity Australia has to export had been sold at the end of the first half of April. According to the same source, dealers who have made purchases of Australian fruit state that sales to the retail trade are slow. A trade report, dated April 21, in the *Economist*, which receives its information from trade sources—which it considers reliable—states that "Australian qualities (of canned fruit) attract much attention at the moment and move off freely"; and a report, dated April 14, from the same source, states that "a good deal of interest is centred on Australian varieties, which show good quality at attractive prices."

Ice-cream in Canada

On the basis of the 1927 population the *per capita* consumption of ice-cream amounts to 43·4 cones.

Ice-cream is now used by all classes, every day of the year, and in a comparatively short time has passed out of the luxury class and taken a very definite place in the diet of Canadians. The consumption of ice-cream is approved by all leading authorities, including the medical profession.

The Dominion Department of Agriculture is interested in the matter of ice-cream consumption from the standpoint of the dairy industry. In 1926 over 206,934,300 pounds of milk were used in the manufacture of ice-cream. This does not include the milk used in powder form, a quantity of which is always used to supply milk solids, not fat. This powder form is dry skimmed milk.

According to the Dairy Branch of the Department of Agriculture the average production of milk in Canada is about 4,500 pounds per cow. Based on these figures it requires a dairy herd of 45,985 head to produce the milk for Canada's ice-cream supply.

Italian Chocolate

The Italian chocolate industry, although of recent development, has had a very rapid and remarkable growth during the past few years. Up to a short time ago the consumer turned to Italy only for ordinary chocolate, but resorted to the imported article if he wished the refined milk chocolate and vanilla creams. During the war imports were shut off and Italy was obliged to supply its own domestic market. Methods of production have, therefore, been perfected, and a fine quality of chocolate, which can be exported, has resulted.

The production of Italian chocolate now seems to lean towards the high-grade quality, for the manufacture of which a large amount of cocoa-butter is required. Even for this product, which was formerly entirely imported, it has been possible to become independent of foreign sources.

FOOD MANUFACTURE is sent to any address in the World for 10s. per annum. Send your subscription now to LEONARD HILL, LTD., Thanet House, 231-2, Strand, London, W.C. 2.

Commercial and Legal News

(The Editor does not accept responsibility for any errors which may occur in the following notices.)

New Companies

HEAD BROS. (GROCERS), LIMITED. (230119) Regd. May 1, 1928. To take over the bus. cd. on at 20, St. James's Street, Brighton. Nom. Cap.: £2,500 in £1 shares.

E. WILBOURN, LIMITED. (230061) Regd. April 28, 1928. To take over the bus. of a tea, coffee, and genl. grocer, cd. on at Station Road, Kirkby-in-Ashfield, Notts. Nom. Cap.: £2,000 in £1 shares.

JOHN HUNT (BOLTON), LIMITED. (230080) Regd. April 28, 1928. To take over the bus. of a bakery engineer and pie machine mnfr. cd. on at Alma Works, Rasbottom Street, Bolton, as "John Hunt." Nom. Cap.: £7,500 in £1 shares.

C. D. ARMFIELD, LIMITED. (230047) Regd. April 28, 1928. To carry on the bus. of bacon, butter, egg and genl. produce factors, etc. Nom. Cap.: £100 in £1 shares.

BOXMEER BACON COMPANY, LIMITED. (230015) Regd. April 27, 1928. To carry on the bus. of slaughterers, salters, and curers of all kinds of meat; farmers, importers and exporters of pigs, etc. Nom. Cap.: £1,000 in £1 shares.

SWIRE'S, LIMITED. (230869) Regd. May 31, 1928. To take over the bus. of a baking powder mnfr. cd. on at Halifax and elsewhere as "Swire's Baking Powder Co." Nom. Cap.: £2,000 in £1 shares.

D. R. AND I. W. KING, LIMITED. (230853) Regd. May 31, 1928. To carry on the bus. of grocers and genl. provn. mchts., etc. Nom. Cap.: £3,000 in £1 shares.

CLEVELAND FARM PRODUCE, LIMITED. (230851) Regd. May 31, 1928. To carry on the bus. as indicated by the title. Nom. Cap.: £6,000 in £1 shares.

HOME STORE (ST. PAUL'S), LIMITED. (230821) Regd. May 30, 1928. To take over the bus. of provn. mchts. cd. on at 214, St. Paul's Road, Canonbury, N., as "The Home Store." Nom. Cap.: £500 in £1 shares.

NU-RAY BAKERY, LIMITED. (230832) Regd. May 30, 1928. 31, Carruthers Street, Manchester. To carry on the bus. of wholesale bakers cd. on at Manchester as "Hodgson's Model Bakery." Nom. Cap.: £2,500 in £1 shares.

SWAN BEVERAGES, LIMITED. (230837) Regd. May 30, 1928. 70, Old Broad Street, E.C.2. To take over the bus. of mineral water mnfrs. and sellers cd. on by Stansfeld and Co., Ltd. (as part of their bus.), at the Swan Brewery, Fulham, S.W. Nom. Cap.: £5,000 in £1 shares.

GUIGOZ SWISS MILK PRODUCTS (LONDON), LIMITED. (230794) Regd. May 29, 1928. 11, St. James's Place, St. James's Street, S.W.1. To enter into an agreement with Fabrique Suisse des Produits au Lait Guigoz, of Switzerland; to acquire the whole or any part of the undertaking of the Guigoz Swiss Milk Products (London), Ltd. (in voluntary liquidation), and in particular the registered trade mark "Guigoz," and to carry on the bus. of dairymen, cheese, butter, and sausage mnfrs. and mchts., etc. Nom. Cap.: £20,000 in 13,000 preference shares of £1 each and 140,000 ordinary shares of 1/- each.

CHARLES BAXTER, LIMITED. (230682) Regd. May 23, 1928. 54/56, Longmore Street, Birmingham. To carry on the bus. of butchers as formerly carried on at Birmingham by C. Baxter. Nom. Cap.: £10,000 in £1 shares.

SOMERS AND KIRBY (LANCASTER GATE), LIMITED. (230804) Regd. May 29, 1928. 20, Leinster Terrace, Bayswater, W.2. To carry on the bus. of butchers, meat purveyors, etc. Nom. Cap.: £1,000 in £1 shares.

WALTERS' "PALM" TOFFEE, LIMITED. (230808) Regd. May 29, 1928. To take over the bus. cd. on at "Palm" Works, Westfields Road, Acton, W., together with the regd. trade mark "Palm" and all other trade marks, property and assets of the vendor in connection or belonging thereto (other than certain land in the rear of the said premises belonging to him but not required for the bus.), to undertake and satisfy all or any of the liabilities of the bus., and to carry on bus. as indicated by the title. Nom. Cap.: £240,000 in 240,000 preference shares of 10/- each and 2,400,000 deferred of 1/-. Minimum subn.: 7 shares of 10/- each.

DAWSONS' BAKERIES, LIMITED. (230756) Regd. May 25, 1928. 97, Wenman Street, Balsall Health, Birmingham. To carry on the bus. of bakers and confectioners, etc. Nom. Cap.: £1,000 in £1 shares.

AMALGAMATED DAIRIES, LIMITED. (F2716) Regd. May 30, 1928. 3, Laurence Pountney Hill, E.C.4. Incorpd. in New Zealand. To enter into an agreement with the New Zealand Co-operative Dairy Co., Ltd., and to carry on the bus. of dairymen, etc. Nom. Cap.: £40,000 in £1 shares.

WRIGHT BROS. (SUNDERLAND), LIMITED. (230962) Regd. June 4, 1928. To take over the bus. of an importer and sauce mnfr., bottler, etc., cd. on at Back Norfolk Street, Sunderland, as "A. B. Wright." Nom. Cap.: £1,000 in 10/- shares.

ALBERT BUTCHER, LIMITED. (230846) Regd. May 31, 1928. 4a, Princess Road, Moss Side, Manchester. To take over the bus. known as "A. E. Butcher" at 4a, Princess Road, Moss Side, Manchester, as general builders, contractors, etc. Nom. Cap.: £500 in £1 shares.

WILSCO, LIMITED. (230932) Regd. June 2, 1928. 42, Lower Stafford Street, Wolverhampton. To carry on the bus. of wholesale and retail grocers, warehousemen, confectioners, etc. Nom. Cap.: £200 in £1 shares.

London Gazette Information

Voluntary Liquidations.

(Note.—Voluntary liquidations may, in some instances, refer to companies in course of reconstruction.)

BRITISH IMPORT AND PACKING CO., LTD. Resolved, June 7, that the company be wound up voluntarily, and that Mr. S. H. Smith, C.A., be appointed liquidator.

INTERNATIONAL DELICACIES, LTD. Resolved, June 14, that the company be wound up voluntarily, and that Mr. T. Froude, C.A. (Oscar Berry, Froude and Co.), Monument House, 16, Monument Street, E.C., be appointed liquidator. Claims should be sent to the liquidator by July 3. (This notice is purely formal; all creditors have been, or will be, paid in full.)

FOOD PRODUCTS, LTD. Resolved, June 8, that the company be wound up voluntarily, and that Sir Harry Peat, 11, Ironmonger Lane, E.C., be appointed liquidator. Claims should be sent to the liquidator by July 31.

DEVONSHIRE CREAMERIES, LTD. Resolved, May 16, that the company be wound up voluntarily, and that Mr. H. Steele, I.A., 25, Brazennose Street, Manchester, be appointed liquidator.

GUIGOZ SWISS MILK PRODUCTS (LONDON), LTD. Resolved, May 19, that the company be wound up voluntarily, and that Mr. F. W. Ratcliff, 11, St. James's Place, S.W.1, be appointed liquidator.

LEDBURY PRESERVES, LTD. (in voluntary liquidation). Claims should be sent to the liquidator, Mr. J. W. Williams, F.S.A.A., I.A., 5, St. Andrews Crescent, Cardiff, by July 10.

Partnership Dissolved.

CATFORD MINERAL WATER CO. (R. Harper, W. C. H. Muncey) Mineral Water Manufacturers, 21, Napier Road, Masons Hill, Bromley, Kent. Mutual dissolution, May 14.

(*Continued from next page.*)

37. Keeping Qualities of Frozen Meat, especially Frozen Sausage Meat. O. Acklin. (*Zeit. Unters. Lebensm.*, 1928, 55, 31.)

38. Treatment of Meats via the Blood Stream. A. Gauducheau. (*Ann. Falsif.*, 1928, 21, 84.)

39. Value of Aluminium and its Alloys in Chemical and Allied Industries. H. Buschlinger. (*Chem. Fabr.*, 1928, 209.)

40. Biological Values of Certain Types of Sea Food, III—Vitamins in Clams. D. B. Jones, E. M. Nelson, J. C. Murphy, and J. P. Devine. (*Ind. Eng. Chem.*, 1928, June, 648.)

41. The Changes Produced in Meat Extracts by the Bacterium *Staphylococcus Aureus*. F. W. Foreman and G. S. Graham Smith. (*Food Investigation, Special Report*, No. 31.)

42. The Control of Reaction in Cultures and Enzymic Digests. F. W. Foreman and G. S. Graham Smith. (*Food Investigation, Special Report*, No. 32.)

Analysis

43. Determination and Application of the Degree of Acidity in the Cane Sugar Industry. P. Honig and V. Khainovsky. (*Archief*, 1927, *Meded.*, No. 17, 639.)

44. Detection of Adulterants in Cacao Butter in Chocolate. Colombier and Chaize. (*Ann. Falsif.*, 1928, 21, 91.)

45. Determination of Coating Material in Coffee. A. Schugowitsch. (*Zeit. Unters. Lebensm.*, 1927, 54, 330.)

46. Acidity of Honey and Artificial Honey. J. Fiehe and W. Kordatzki. (*Zeit. Unters. Lebensm.*, 1928, 55, 59.)

47. Separation of Honey. J. Fiehe. (*Zeit. Unters. Lebensm.*, 1928, 55, 64.)

48. Rapid Test of Pepper Powder for Excessive Chalk Content. W. Plahl. (*Zeit. Unters. Lebensm.*, 1927, 54, 369.)

49. Chemical Analysis of Nutritive Preparations. E. Komm and R. Müller. (*Zeit. Unters. Lebensm.*, 1928, 55, 53.)

50. Technique of Biological Protein Differentiation. A. Brüning and B. Kraft. (*Zeit. Unters., Lebensm.*, 1927, 54, 347.)

51. Detection and Determination of Methyl p-hydroxybenzoate in Foodstuffs. F. Weiss. (*Zeit. Unters Lebensm.*, 1928, 55, 24.)

52. Report of the Government Laboratory at Amsterdam for 1927. J. Straub. (*Chem. Weekblad*, 1928, 25, 161.)

53. Determination of Butter in Margarine. L. V. Cocks and E. Nightingale. (*Analyst*, 1928, June, 322.)

54. Determination of Shell in Cocoa Products. E. Alpers. (*Zeit. Unters. Lebensm.*, 1927, 54, 462.)

55. Occurrence of Labile Phosphorus in Various Kinds of Muscles. L. Irving and P. H. Wells. (*Jour. Biol. Chem.*, 1928, 77, 97.)

Current Literature

Fruit and Vegetable Products

1. The Successful Cider Mill of To-day. H. F. MacMillin. (*Fruit Prods. Jour.*, 1928, May, 9.)

2. Investigations of the Use of Fruits in Ice-Cream and Ices, III. G. D. Turnbow and W. V. Cruess. (*Fruit Prods. Jour.*, 1928, May, 12.)

3. The Rôle of Viscosity in Heat Penetration—Heat Penetration in Sugar Solutions, I. M. A. Joslyn. (*Fruit Prods. Jour.*, 1928, May, 16.)

4. Crushed Peaches—A New Canned Peach Product. W. V. Cruess and J. H. Irish. (*Fruit Prods. Jour.*, 1928, May, 20.)

5. By-Products of the Pineapple Canning Industry. V. R. Greenstreet and G. L. Teik. (*Agric. Jour. of Malay*, 1928, vol. 16, 8.)

6. Proper Rotations for Profitable Canning Pea Yields. E. J. Delwiche. (*Canner*, 1928, May 26, 15.)

Cereal Products

7. Glutelins of the Cereal Grains. R. K. Larmour. (*Jour. Agric. Res.*, 1927, 35, 1091.)

8. Determination of Dextrose in Presence of Proteins; with Particular Reference to Starch in "Gluten" Bread. P. Fleury and G. Boyeldieu. (*Jour. Pharm. Chim.*, 1928 [viii.], 7, 207, 249.)

9. Study of Solubility of Certain Metals and their Effect on Colour of Canned Corn. C. J. Meister. (*Canner*, 1928, May 12, 17.)

10. Addition of Protomalt to Rye Bread. M. P. Neumann. (*Zeit. Unters. Lebensm.*, 1927, 54, 341.)

11. Properties and Uses of an Edible Rice Cellulose. E. R. Harding. (*Ind. Eng. Chem.*, 1928, 20, 310.)

12. Detection and Determination of Rice Flours in other Flours and in Spices. M. Wagenoar. (*Zeit. Unters. Lebensm.*, 1927, 54, 357.)

13. Correlation of Kernel Texture, Test Weight per Bushel, and Protein Content of Hard Red Spring Wheat. J. H. Shollenberger and C. F. Kyle. (*Jour. Agric. Res.*, 1927, 35, 1137.)

14. Extractor for the Preparation of Oat and other Cereal Oils. L. A. Munro and D. S. Binnington. (*Ind. Eng. Chem.*, 1928, 425.)

15. Talliowiness or Rancidity in Grain Products. M. S. Fine and A. G. Olsen. (*Ind. and Eng. Chem.*, 1928, June, 652.)

16. Determination of Chlorine in Bleached Flour. A. Seidenberg. (*Jour. Assoc. Off. Agric. Chem.*, 1928, II., 132.)

17. Lipoid Phosphorus of Wheat and its Distribution. B. Sullivan and C. Near. (*Cer. Chem.*, 1928, May, 163.)

18. Effect on their Bread-Making Properties of Extracting Flours with Ether. A. H. Johnson. (*Cer. Chem.*, 1928, May, 169.)

19. Yeast Fermentation in Flour-Water Suspensions. T. R. James and L. X. Huber. (*Cer. Chem.*, 1928, May, 181.)

20. A Study of "Rope" in Bread. E. A. Fisher and P. Halton. (*Cer. Chem.*, 1928, May, 192.)

21. A Volume Measuring Device for Small Loaves. W. F. Geddes and D. S. Binnington. (*Cer. Chem.*, 1928, May, 215.)

22. The Action of Phosphatides in Bread Dough. E. B. Working. (*Cer. Chem.*, 1928, May, 225.)

Dairy Products

23. Effect of Working of Cows on the Composition of the Milk. F. Haun. (*Zeit. Unters. Lebensm.*, 1927, 54, 337.)

24. Solids-not-Fat as Criterion for Watered Milk. C. E. Klamer. (*Zeit. Unters. Lebensm.*, 1928, 55, 45.)

25. Nature of the Neutralization Precipitate and its Effect on the Recovery of Milk Sugar from Grain-Curd-Casein Whey. R. W. Bell and P. N. Peter. (*Ind. and Eng. Chem.*, 1928, May, 510.)

26. Milk from Sick Cows. J. Krenn. (*Zeit. Unters. Lebensm.*, 1928, 55, 47.)

27. Preservation of Milk Samples for Fat Determination. P. Marschew. (*Milch. Zentr.*, 1928, 57, 85.)

28. Determination of Milk Fat in Small Quantities of Fat. J. Grossfeld and F. Wissemann. (*Zeit. Unters. Lebensm.*, 1927, 54, 352.)

29. Determination of Chlorine and Sodium in Mammalian Milks. L. Bartre and E. Dufilho. (*Ann. Falsif.*, 1928, 21, 98.)

30. Composition of Camembert Cheese at Various Stages of Ripening. M. P. Babkin. (*Trans. Vologda Dairy Inst.*, 1926, *Bull.* 65, 205.)

31. Determination of the Degree of Rancidity in Butter. G. S. Inikhov and A. F. Shoshin. (*Trans. Vologda Dairy Inst.*, 1926, *Bull.* 64, 161.)

32. Butter-Fat of Colostrum. K. A. Kurochkin. (*Jaroslav Zootech. Exp Stat.*, (1926), 1927, 142.)

33. Use of Janus-Green in the Reductase Test for Milk. A. R. Tankard. (*Analyst*, 1928, 53, 213.)

Various

34. Grading of Commercial Gelatine and its Use in the Manufacture of Ice-Cream, III. A. C. Dahlberg, D. C. Carpenter, and J. C. Hening. (*Ind. and Eng. Chem.*, 1928, May, 516.)

35. Water for the Canning Factory. M. R. Daughters. (*Canner*, 1928, May 19, 17.)

36. Vacuum and its Application to Packing in Glass Containers, II, III, IV. D. M. Gray. (*Canner*, 1928, April and May.)

(*Continued on previous page.*)

Recent Patents

These particulars of New Patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office.

Latest Patent Applications

16593. HOMFREEZE CORPORATION: Food compositions. June 7.

16538. HURRELL, G. C.: Concentrated soups. June 7.

15774. DUNHAM, R. W.: Apparatus for treating granulated cereals, etc. May 30.

15904. GRAHAM, R.: Bread, and process of making same. May 31.

15317. FERGUSON, J. L.: Puffing cereals. May 24.

Specifications Published

291,127. JANSEN, H. C., AND JANSEN, J. P. H.: Manufacture of yeast.

291,124. NORTH, DR. C. E.: Manufacture of beverages.

291,135. SCOTT, W.: Process of and apparatus for treating yeast.

290,728. BACON, M. L.: Process and apparatus for curing or preserving meat, bacon, hams, tongues, and other food materials.

290,852. HORST, E. C.: Method of preparing hop extracts and the product obtained.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at the uniform price of 1s. each.

Abstracts Published

289,187. **Vitamins.** BRITISH DRUG HOUSES, LTD., AND CARR, F. H., 16, Graham Street, City Road, London.

Vitamins are extracted from mammalian livers by means of an animal, vegetable, or mineral oil or fat. The oil, etc., mentioned are paraffin B.P., linseed oil, lard, cocoa-butter, and, in the Provisional Specification, arachis oil. The extract is suitable for pharmaceutical use or for food preparations. The liver, such as lambs' or ox liver, is minced and mixed with the oil at ordinary temperature, and after remaining in contact for a sufficient time, the oil is separated by pressure, washed with water, dried with anhydrous sodium sulphate, and clarified by filtration. Examples describe the treatment of minced lambs' liver, the extraction treatment lasting for three days at ordinary temperature or 3½-4 hours at 55-60° C. The liver may be mixed with an absorbent material such as sawdust, left for a time, such as fourteen hours, and then treated with the oil for about the same time.

289,060. **Bread.** AUGMENTINE SOC., Anon., Lausanne, Switzerland.

To increase the yield of bread from a given quantity of flour a small quantity of an emulsion consisting of a neutral fat, glycerine, and water is added during the preparation of the dough. For example, to 100 kgs. of flour mixed with 66·5 litres of water and about 2 kgs. of salt and 1 kg. of yeast are added 300 grs. of an emulsion consisting of 55 parts of paraffin oil, 35 parts of glycerine, and 10 parts of water. The dough is kneaded for 12-15 minutes at about 38° C., left to stand for 10-15 minutes, moulded, cooled slightly, and then baked.

288,310. **Freezing organic liquids.** TSITOVITSCH, B., 16, Viru Tan, Reval, Esthonia.

Solutions of bio-colloids, such as fruit and plant juices, medicinal toxines, beer, milk and cream are rapidly frozen into an amorphous condition by spraying into a freezing chamber. By this means the structure of the substance remains unbroken and the water is not separated out.

287,863. **Filling containers with ice-cream, etc.** KICK PRODUCTS CORPORATION, Grand Junction, Colorado, U.S.A.

Cutting apparatus. An appliance for filling paper, pastry, etc., containers with ice-cream, etc., comprises a hollow die adapted to hold the container and adapted to be inserted into a mass of the material to fill the container. The appliance comprises a pair of hollow hemicylindrical members connected by a hinge and furnished with handle portions. The container is supported by a flange below which is formed a tapered cutting-edge. An exterior flange, below the hinge, limits the penetration of the device into the material. To facilitate escape of air and entrance of a charge of material, a pair of sharp-edged lugs are provided beneath the flange. In use, a container is inserted and the hollow hemicylindrical members closed together, after which the device is inserted repeatedly into the mass of material and given a slight turn. Smaller containers are filled by the use of a packing-block.

Recent Trade Marks

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal," and is published by permission of the Controller of H.M. Stationery Office.

SHAKA

490,973. **Salt for food.** ARTHUR BURROWS, Brookside, Church Minshull, Middlewich, Cheshire. June 6.

ABBOTSMEAD

490,968. **Butter.** WILLIAM KINGHAM AND SONS, Queen's Wharf, Reading; 16, 17, and 18, West Street, Farnham; and 16, Eastcheap, London, E.C.3. June 6.

ISLAND

488,828. **Cheese.** REGINALD MAURICE RUSSELL, Stoke Park Farm, Bishopstoke, Hampshire. June 6.

GONDOLA

488,722. **Biscuits.** CARR AND COMPANY, LIMITED, 54, Church Street, Carlisle. May 23.